

SYSTEMATIC REVIEW OF GLOBAL HEALTH RESPONSE TO COVID-19

Strategic Focus on Pakistan and
Sindh in Specific



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EXECUTIVE SUMMARY

With the beginning of year 2020, the world witnessed a highly contagious disease, known as Novel Corona Virus Disease 2019 i.e. "COVID-19" which has changed the lives of everyone on the planet earth. Within three months' time, this disease took shape of a pandemic, of a scale the world has never seen before. Although there have been pandemics in the past, but the scale and gravity of COVID-19 has directly or indirectly affected people from all walks of life. Therefore, it is an opportune time to delve into critical analysis of government's initiatives and plans to strengthen health systems in Pakistan (especially with reference to Sindh) in the context of COVID-19 pandemic. This research is primarily for policy makers who can direct and steer policy by understanding the current situation of health care system in Pakistan in general, and in Sindh in particular. This research can be used as a frame of reference for policy makers to make informed decisions which can positively impact the lives of millions of people in Sindh vis-à-vis health systems strengthening.

This research highlights the current situation of the existing health system in Pakistan, immediate responsive steps taken by the Federal government, Government of Sindh, and different initiatives taken by both the governments to tackle the spread of COVID-19. Furthermore, this research sheds light on how countries reacted and responded, especially the ones which were hit first. This research focuses on how countries contained the disease and limited its spread, from a health systems perspective, to draw lessons in terms of areas of improvement for Pakistan. Lastly, the research focuses on the bottlenecks present in the health systems of Sindh in particular and of Pakistan in general and how can they be overcome to effectively deal with public health problems, especially pertaining to communicable diseases.

A key finding was that with limited resources, the government of Sindh took timely and bold actions to contain the spread of COVID-19 as it has spread in countries which had more resources than Pakistan. The political leadership and provincial government of Sindh was the most pro-active in terms of pre-emptive measures and coordinated efforts to tackle the pandemic from the onset. It was also found that the federal government endeavored to achieve the dual objective of containing the spread of COVID-19 while also mitigating the socio-economic impact due to the lockdown. The research also explores the best practices which different countries had adopted to contain the spread. COVID-19 spread has highlighted the issues plaguing Pakistan's healthcare system, especially pertaining to the inadequacy to deal with infectious diseases. With adequate allocation and effective utilization, technical, financial and human resource capacities can be augmented to better deal with similar pandemics in the future.

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I. INTRODUCTION

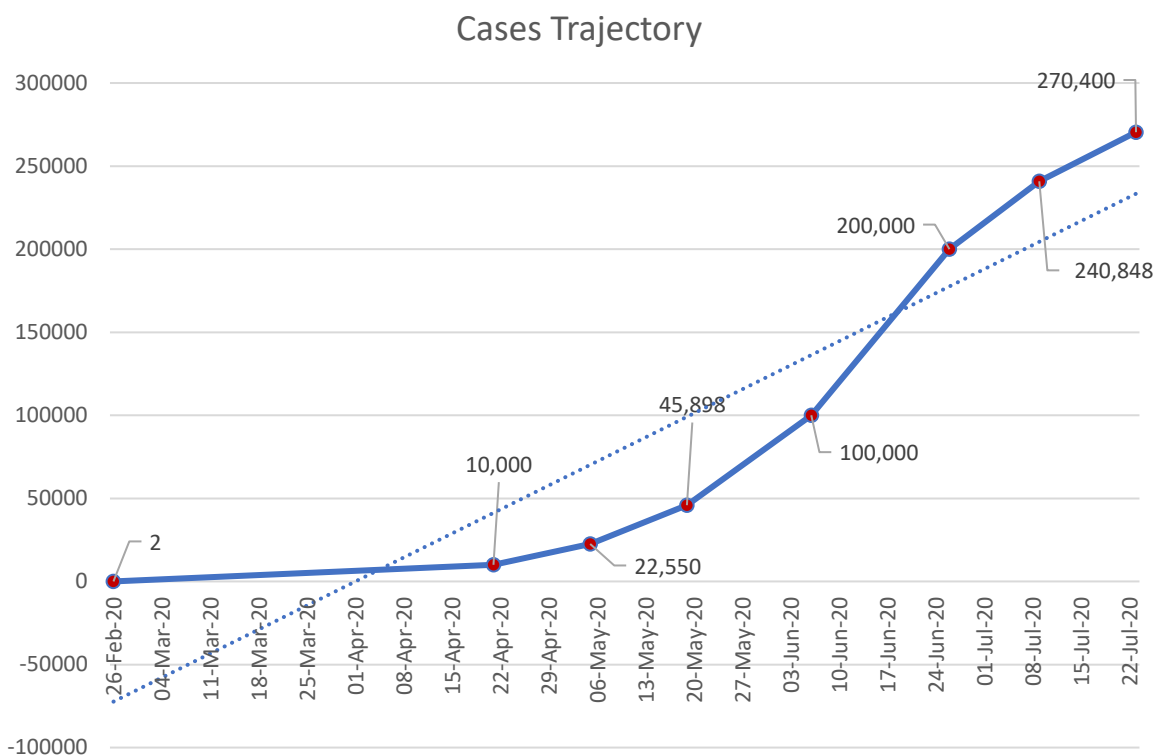
According to (World Bank, 2012), the government of Pakistan is committed to improving the equity of health outcomes and the ability to offer financial protection in the health sector through the implementation of the National Health Policy. The state vision of the National Health Policy as defined by (Ministry of Health, 2009) is “A health system that: is efficient, equitable and effective to ensure acceptable, accessible and affordable health services. It will support people and communities to improve their health status while it will focus on addressing social inequities and inequities in health and is fair, responsive and pro-poor, thereby contributing to poverty reduction (Ministry of Health, 2009)”. The ministry of health further states that it is “critical to move towards a system which is able to address the challenges and prevents households from falling into poverty. In Pakistan, health sector investments are viewed as part of the government’s poverty alleviation endeavor. To make progress towards achieving the [Millennium Development Goals] MDGs is a national commitment which envisages reducing poverty by 2015”.

To draw key lessons from strategic planning perspective, this research report analyses the situation of health sector in Pakistan and in Sindh, the recent developments made in accordance with COVID-19, and how countries dealt with the pandemic successfully.

II. SITUATIONAL ANALYSIS

Pakistan’s Situation

COVID-19 had emerged in China in late 2019 and first case of COVID-19 in Pakistan was reported on 26 February, 2020 in Karachi, and the second case in Federal territory of Pakistan the same day. Both cases had travel history of Iran (DAWN, 2020). As of present i.e., 9 July, 2020 the number of cases in Pakistan have risen to 240,848 cases while 4,983 people have died due to COVID-19 (Government of Pakistan, 2020). With respect to rise in number of cases, according to (Tribune, 2020), Pakistan had crossed its unfortunate milestone of 10,000 cases on 21st April, 2020 i.e., within 56 days since the disease was first reported in Pakistan. However, after 100 days of COVID-19 in Pakistan, the number of confirmed cases rose to 100,000 on 6th June, 2020. On 26th June, 2020 – the national tally crossed the figure of 200,000 confirmed cases and by 22nd July, 2020, the cases had risen to 270,400 (Government of Pakistan, 2020). The exponential rise in the cases can be clearly observed as lockdowns were eased in beginning of May, and by end of May, during the Eid-ul-Fitr days, the incidence of cases increased massively. Along with ease in lockdown, the uncertainty of spread of SARS-CoV-2 through different media caused the cases to rise. Whereas, the explanation for exponential growth of the disease is purely mathematical, more needs to be unpacked in terms of causal attribution. It was almost after two weeks of hitting 100,000 cases, the testing peaked on 19th June, 2020 i.e., 31,681 tests in a single day where 19 % tested positive. Since then, the total number of tests conducted per day has decreased where currently (as of July 15th, 2020), 24,244 tests were conducted in a day where 9% tested positive. Whereas, the number of cases around the globe have risen more than 13,255,929 resulting in 554,042 deaths (Worldometer, 2020). The following graph shows the rapid increase of cases from April till end of June with slightly decreasing trend in the incidence from July.



Sindh's Situation

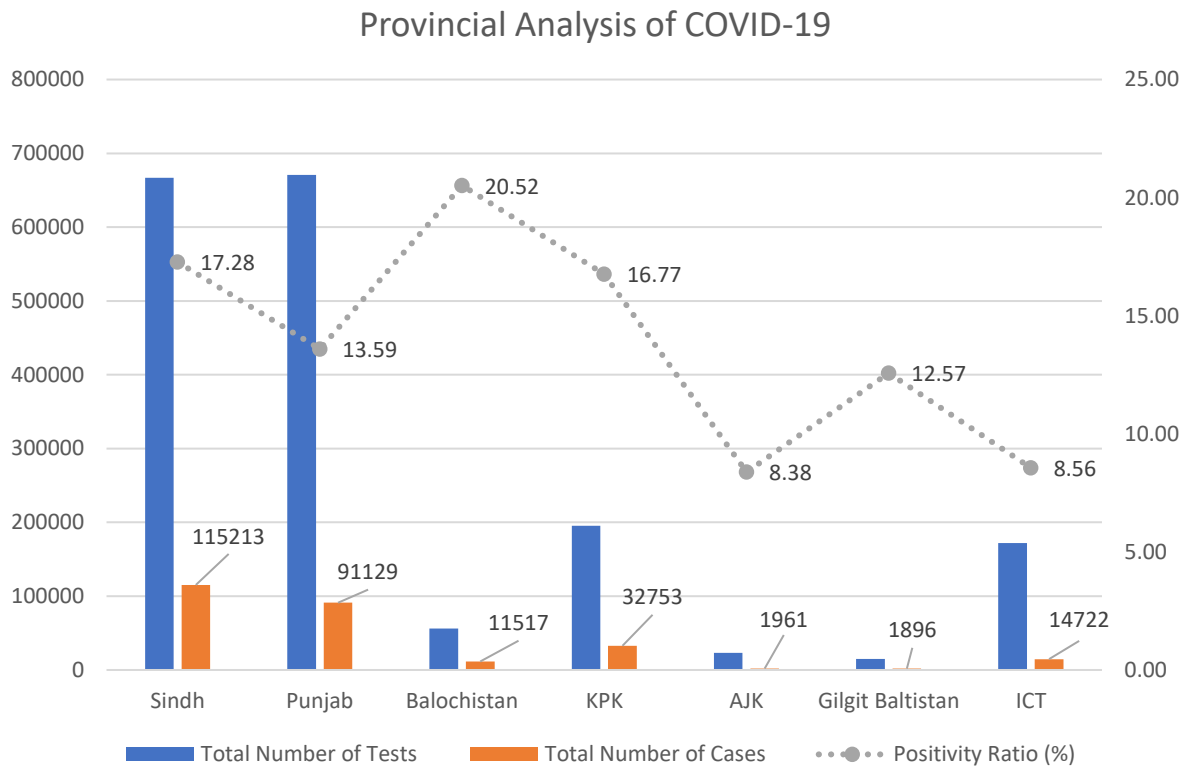
The first case of COVID-19 to be reported in Sindh was on 26 February 2020 (DAWN, 2020). As of present i.e., 9 July, 2020 the number of cases in the province of Sindh of reached 101,041, while 1702 people have lost their lives due to COVID-19 (Health Department, Government of Sindh, 2020). However, in the Punjab, there had been 85,261 cases (Government of Pakistan, 2020). Despite Punjab having more than double the population of Sindh, the number of cases has been fewer in Punjab. A reason could be that up to 10 July, 2020, the number of tests conducted in Punjab was a little more than 571,000 while, in Sindh, till the same date, more than 557,000 tests had been conducted (Tribune, 2020). This clearly shows that there have been fewer tests per capita in the Punjab which essentially means that Sindh has a significantly higher testing average than Punjab after adjusting for respective populations. Inter-provincial disparity in testing average might be driven by several reasons, but Sindh's pro-active testing is laudable.

Table¹ gives a snapshot of the positive number of COVID-19 cases in each district of Sindh as of 9 July, 2020 at 2140 hrs. Source: (Health Department, Government of Sindh, 2020). Karachi's East and South district have been the most affected districts of Sindh, both of which have more than 17,000 confirmed cases. Followed by other districts of Karachi. Whereas, all other districts of Sindh have fewer cases, where only Hyderabad, Sukkur and Ghotki have cases between 3,000 and 4,000. While, in the rest of the districts of Sindh, there are less than 2,503 cases (Government of Sindh, Health Department, 2020). The high incidence in Karachi could be due to several reasons. Firstly, Karachi is a highly dense city and can be termed as the only megalopolis of Pakistan. In Karachi, people are living in close proximities. Secondly, infrastructure of Karachi, like other megalopolises of world, is not conducive for physical distancing demands to curb the transmission of COVID-19. Other reasons

¹ Cases in each district of Sindh

of high incidence could be non-adherence of SOPs laid down by the government by the masses and overall complacent behavior of the masses.

The following chart shows the total number of cases, and total number of tests conducted across provinces, federal capital and administrative areas under Pakistan till 23 July, 2020 (National Command and Operations Centre, 2020)



Public Health and Development Response by GoS

In anticipation of the pandemic, the government of Sindh had been proactive in tackling the pandemic. Therefore, weeks before first case of COVID-19 was confirmed in Pakistan, the Government of Sindh had constituted Rapid Response Medical team on February 3, 2020. The main task of this Rapid Response Medical Team was to identify potential cases of COVID-19 and isolate them so that they do not spread the disease. Similarly, timely formation of Task Force was undertaken by the government of Sindh just a day after first case of COVID-19 was confirmed in Pakistan (Tribune, 2020). According to daily situation report of the health department (Health Department, Government of Sindh, 2020), Rapid Response Teams were made at 29 districts, and led and administered by the Deputy Commissioners and Commissioners. All the teams are equipped with relevant resources including financial, physical and medical resources.

The Task Force is headed by the Chief Minister Murad Ali Shah himself and has members which include provincial Chief Secretary, provincial health secretary, Commissioner Karachi and other health officials (DAWN, 2020). The task force was created to control the pandemic and minimize its affect in Sindh in addition to overseeing procurement, regulations and managerial aspects

pertaining to the pandemic. The following committees were constituted as a result of the Terms of References of the task force:

Training and capacity enhancement committee

Supply Chain Logistics Committee

Strict Quarantine Committee

Testing capacity enhancement committee

Research Committee

The immediate response by the above-mentioned task force was to oversee and manage end-to-end strategic components of the COVID-19 response. Several quick strategic actions were undertaken to curb the local transmission in Sindh which included developing quarantine and isolation protocols, ensuring expeditious procurement of equipment for testing and treatment, identification of quarantine & isolation accommodation facilities, and ensuring strict airport screening protocols. Moreover, it was advised to the federal government by the Chief Minister Sindh to stop flights from Iran.

Keeping in mind how educational institutes might potentially increase the spread of COVID-19, the Government of Sindh was prompt in closing down all private and public educational institutes in the province just a few hours after the confirmation of first COVID-19 case in Pakistan (Tribune, 2020).

On February 27, 2020 an "Emergency Control Room for Novel Corona Virus" was established at Health Department of the Government of Sindh to oversee and manage the pandemic public health response in the province (Health Department, Government of Sindh, 2020).

On March 18, 2020 a "Coronavirus Emergency Fund" (CEF) was established by the Government of Sindh to fight against the coronavirus pandemic through immediate mobilization of required resources. To manage this CEF, a high-powered committee was formed, which was headed by the Chief Secretary Sindh. In order to ensure transparency, and technically sound decisions, the committee has adequate representation of private sector with requisite technical expertise. The committee includes, Dr. Abdul Bari (CEO Indus Hospital), Mr. Mushtaq Chhapra (renowned philanthropist), and Mr. Faisal Edhi (Edhi Foundation). Other members of the committee include Secretary Finance, and Secretary Health. The CEF Committee had been tasked with allocating resources and overseeing expenditure from CEF to supplement Sindh Government's efforts in combating coronavirus emergency (Finance Department, Government of Sindh, 2020).

Despite all the efforts and measures, there was an increase in the number of COVID-19 cases, therefore, on March 22, 2020 after five precious lives were lost, the Government of Sindh imposed complete ban on people's movement, with few exceptions, to control the spread of COVID-19 (Tribune, 2020).

On April 17, 2020, the government of Sindh collaborated with the Aga Khan University Hospital (AKUH). According to the collaboration, AKUH would provide free of cost training and technical assistance on COVID-19 critical care to healthcare professionals working in the public sector. As part of the partnership, the university would also provide expert coverage to public sector intensive care units via telemedicine, and capacity building services to physicians and nurses working in emergency medicine and critical care in the province of Sindh. Besides capacity building, healthcare professionals would also benefit from the University's teleconsultation services on critical care issues such as ventilator management of coronavirus patients. According to (The Aga Khan University ,

2020), it was decided that “AKU experts will help manage care with doctors in Sindh as well as offer advanced training for nurses on treatment of critically ill patients and safety of healthcare workers”. Other than the collaboration mentioned above, AKU also collaborated with the government of Sindh in augmenting diagnostics, and treatment capacity, ensuring transparent COVID-19 related procurement and financial management, surveillance systems, predictive modelling, zero-prevalence studies etc. Similar collaborations were also formalized with Indus Hospital which already undertook several initiatives under public-private partnerships with the government of Sindh previously (Indus Hospital, 2020).

In terms of COVID-19 responsive budgetary allocations to address the socio-economic impact, Government of Sindh took various measures to support Micro, Small and Medium Enterprises, in a COVID-19 stimulus package of more than Rs. 34 billion with a focus on social protection and economic sustainability program². Main allocations include:

- Rs. 20 billion in cash transfers under Sindh Peoples Support Program
- Rs. 5 billion in soft loans to Small and Medium Enterprises with a provision of up to Rs. 2 million for each loan along with Rs. 3 billion for Small Businesses in urban areas with a loan size up of to Rs. 0.2 million
- Rs. 1.2 billion for supporting technology-based incubators, accelerators, and innovative interventions in goods supply chain

Government of Sindh has also earmarked a total of Rs. 3 billion in subsidies for rice seeds, fertilizers and pesticides. These subsidies are targeted towards farmers with land holdings of less than 25 acres.³

In addition, the MSME package included Rs. 2 billion have been earmarked for small farmers/community-based loans in rural areas and Rs. 500 million to support livestock breeding.⁴

In addition to the economic support package, the provincial government also allocated PKR 11 billion in wheat subsidy for procurement. Despite resource constraints, the allocation is higher than previous year to vulnerable rural population due to COVID-19.⁵

Sindh government also formulated a law, now an Act, called Sindh COVID-19 Emergency Relief Ordinance, 2020. The law is designed to alleviate the problems faced by businesses and households due to COVID-19 through several initiatives such as support to residential consumers in monthly bills of water and sewerage vis-à-vis deferred payments option.

In addition to laying off workers, this acts also prevents businesses from reducing salaries during the lockdown/closure periods.⁶ To offset the financial impact of facilitating the employees, Government of Sindh has given tax reductions to such businesses as an incentive to retain employees.

COVID-19 Peak, Mortality, Spread in Provinces

Although the peak of pandemic is hard to ascertain for any expert and only estimates can be given. The Prime Minister of Pakistan while addressing the nation on state television told that the peak of COVID-19 was expected to come by end of July or August of 2020 (Tribune, 2020). Similarly, mortality

² Finance, Sindh Government, 2020

³ Finance, Sindh Government, 2020

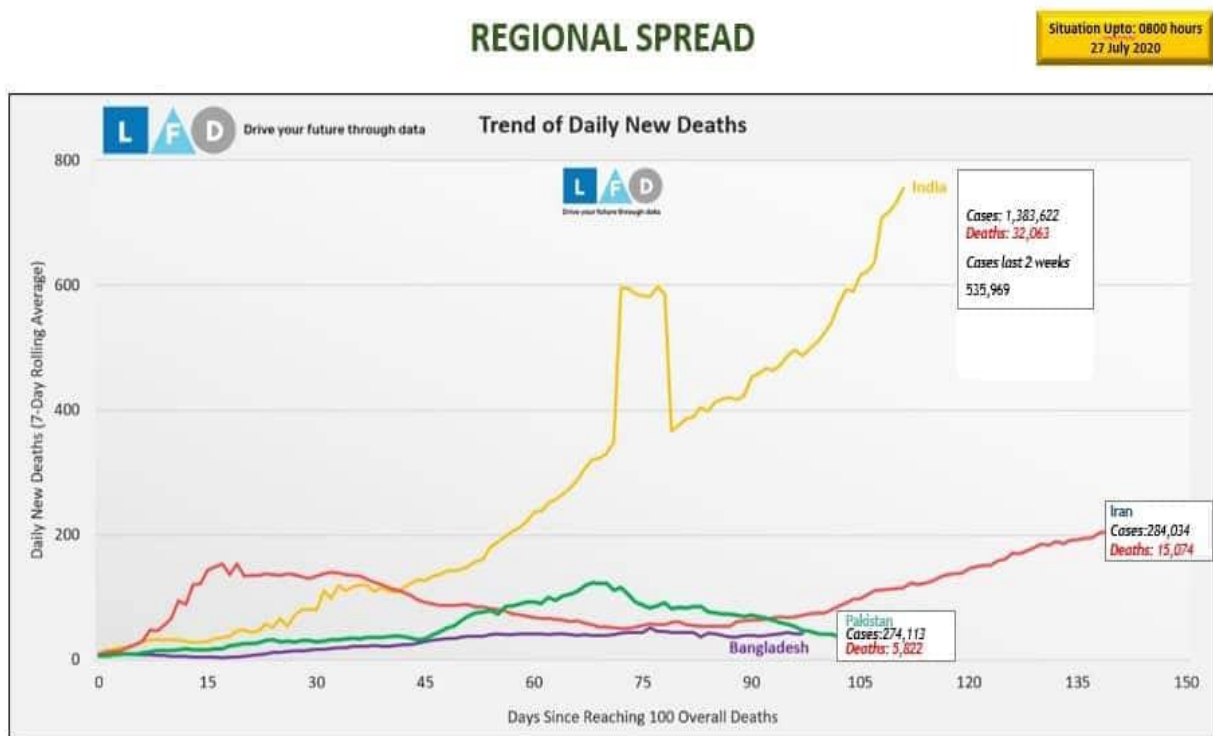
⁴ Ibid

⁵ Ibid

⁶ EFP, 2020

rate varies from time to time and place to place. If we consider the above data, we can argue the mortality rate to be around 2%. According to (CoronaTracker, 2020) the mortality rate in Pakistan is 2.1%. According to federal government’s dashboard for COVID-19 (Government of Pakistan, 2020), the province of Sindh has highest number of cases at roughly 41 % cases of all Pakistan. Sindh is followed by Punjab, which has around 35% cases from Pakistan. At third number is the province of KPK, which contributes to 12% of cases in Pakistan. The province of Balochistan is at the fourth number contributes with 4.5% of total cases of Pakistan.

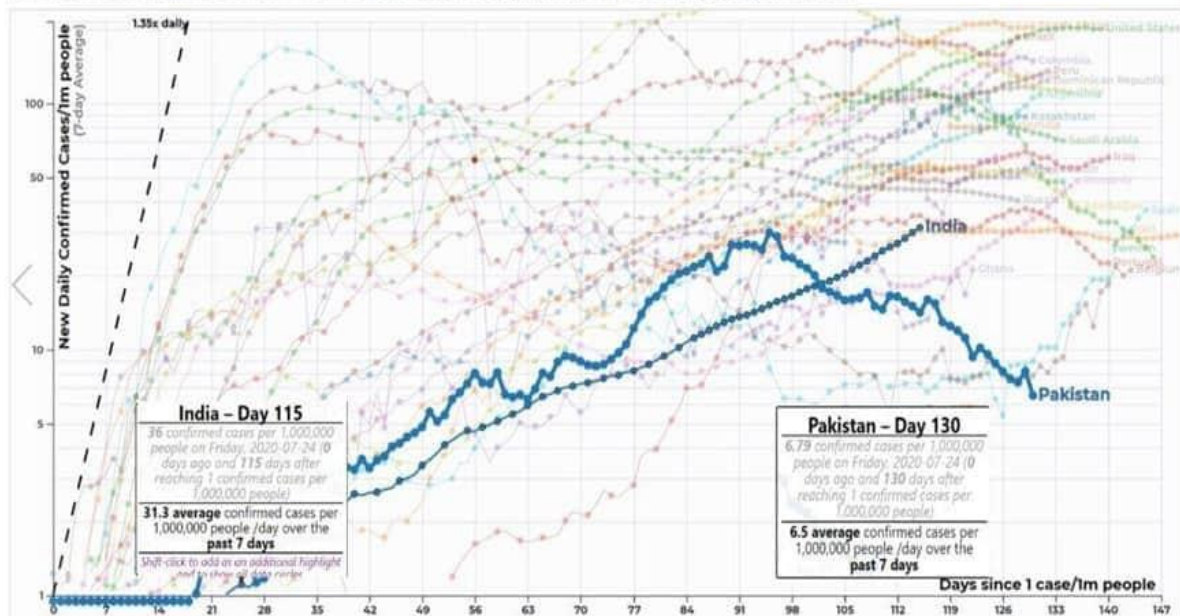
The federal capital, Islamabad contributes to around 5.7% cases of Pakistan. Whereas, AJK and GB combine to form almost 1.27% cases of Pakistan. With the start of pandemic, most parts of the world had gone into lockdown. Similarly, different provincial governments of Pakistan had started to enforce lockdown in different parts of the country to curb the spread of virus by end of March 2020. However, most of the lockdowns had become partial in their enforcement by the mid of May 2020 as it had been adversely affecting the economy, especially the livelihoods of vulnerable segments of population.



Therefore, the National Command and Operational Centre (NCOC) was established, which is the nerve centre to synergize and articulate unified national effort against COVID-19, and to implement the decisions of National Coordination Committee on COVID-19. The centre is one window operation to collate, analyse and process information based on digital input and human intelligence across Pakistan through all Provinces, AJ&K, GB & ICT dedicated representatives and centres (NCOC, 2020).

NCOC identified different hotspots of the COVID-19 and enforced smart lockdown in those areas. Initially, 20 such cities with their districts were earmarked by NCOC for smart lockdown (The News, 2020). The following chart depicts how COVID-19 cases in India have been rising whereas declining in Pakistan per day, normalized by population (Khan I. , Imran Khan Official , 2020). Similarly, the following chart explains the different trend of daily new deaths in the region where the number of deaths has been declining in Pakistan whereas rising in India and Iran (Khan I. , Imran Khan Official, 2020).

New Confirmed COVID-19 Cases per Day, normalized by population



III. GLOBAL RESPONSE AND HEALTH SYSTEM READINESS, SURVEILLANCE SYSTEMS, PANDEMIC RESPONSE TO COVID-19 BY COUNTRIES WHICH WERE HIT INITIALLY

World Health Organization

The World Health Organization (WHO) representative to China alerted the world by stating that, "Preliminary identification of a novel virus in a short period of time is a notable achievement and demonstrates China's increased capacity to manage new outbreaks." (China Daily, 2020). It was only on 11 March, 2020 that WHO declared COVID-19 a pandemic once it had swept into 114 countries and killed more than 4000 people (China Daily, 2020). According to the Director General WHO, it was the first pandemic caused by coronavirus. The WHO rightly alerted the world to prepare themselves as it was deeply concerned, both by the alarming levels of spread and severity, and by the alarming levels of inaction by the world's leaders in response to the outbreak.

By cautioning about the pandemic, the DG WHO also urged people not to be fearful because of its status as a pandemic. With regards to preparedness and assessment of the threat posed by the virus, the WHO reiterated its efforts and emphasized that the countries should also take actions.

With regards to preparedness, according to its Situation Report (World Health Organization, 2020), WHO had been in direct and regular contact with the Chinese as well as Japanese, Thai and Korean authorities. Therefore, on 2 January 2020, the incident management system was activated across the three levels of WHO (country office, regional office and headquarters). The same Situation report further claims that WHO developed the surveillance case definitions for human infection with 2019-nCoV and is updating it as per the new information becomes available. The WHO developed interim guidance for laboratory diagnosis, clinical management, infection prevention and control in health care settings, home care for mild patients, risk communication and community engagement. The WHO prepared disease commodity package for supplies necessary in identification and management of confirmed patients. The WHO provided recommendations to reduce risk of transmission from animals to humans. The WHO updated the travel advice for international travel in health in relation to the outbreak of pneumonia caused by a new coronavirus in China. The WHO started utilizing global expert networks and partnerships for laboratory, infection prevention and control, clinical management and mathematical modelling. The WHO activated R&D blueprint to accelerate diagnostics, vaccines, and therapeutics. WHO also started to work with its networks of researchers and other experts to coordinate global work on surveillance, epidemiology, modelling, diagnostics, clinical care and treatment, and other ways to identify, manage the disease and limit onward transmission (World Health Organization, 2020).



China

Preliminary information from the Chinese investigation team, including the occupation, location and symptom profile of the people affected, pointed to a coronavirus as the possible pathogen responsible. According to Xu Jianguo, the Chinese expert who led the team evaluating the pathogen test results, the coronavirus is a novel one that can cause severe illness in some patients but not one that is readily transmitted from person to person. China has strong public health capacities and the necessary resources to respond and manage respiratory disease outbreaks, but any new developments need to be reported by the authorities in a timely manner, so that effective action can be taken and the public can be informed if they need to take any precautionary and preventive measures. (China Daily , 2020)

According to (World Health Organization, 2020), National authorities of China conducted active case finding in all provinces. Similarly, since 14 January 2020, 35 infrared thermometers have been installed in airports, railway stations, long-distance bus stations, and ferry terminals in China. Along with it, search expanded for additional cases within and outside of Wuhan City. A total of 763 close

contacts including healthcare workers, had been identified and followed up and no additional cases of infection with the novel coronavirus was identified. Furthermore, active / retroactive case finding in medical institutions in Wuhan City. The Huanan Seafood Wholesale Market in Wuhan city was closed on 1 January 2020 for environmental sanitation and disinfection. Market inspection in expansion to other markets. Public education on disease prevention and environmental hygiene further strengthened in public places across the city, farmers' markets in particular (World Health Organization, 2020).

Republic of Korea

As Korea was also amongst the initial hit countries, according to (World Health Organization, 2020), contact tracing and other epidemiological investigation initiated as soon as cases arrived. The government of the Republic of Korea had scaled up the national alert level from Blue (Level 1) to Yellow (Level 2 out of 4-level national crisis management system). The Republic of Korea health authority had strengthened surveillance for pneumonia cases in health facilities nationwide since 3 January 2020. Quarantine and screening measures had been enhanced for travelers from Wuhan at the point of entries (PoE) since 3 January 2020. The Korean government introduced an entry ban on foreign nationals from Hubei Province, strengthened visa screening of travelers from China and Japan, and designated China (including Hong Kong, Macau), Italy, and Iran as 'quarantine inspection required areas', to tighten screening of travelers from these countries (Ministry of Health and Welfare, Government of Korea, 2020) . Furthermore, from March 19, all inbound travelers (Korean and foreign nationals) received temperature screening and filled out the Health Questionnaire and Special Quarantine Declaration in accordance with the Special Entry Procedure. All travelers subject to the special procedure could enter the nation after their contact information and address of residence in Korea was verified. They were also required to install either the "Self-Quarantine Safety Protection App" or "Self-Diagnosis App" on their phones to monitor if they showed symptoms that indicated infection of COVID-19 such as fever during their stay in Korea. All inbound travelers must install either of the two applications, to check their health status and record if they develop any symptom on a daily basis for 15 days beginning from the day of arrival. In addition,



the list of incoming travelers was provided to each local government (city or province) in an effort to strengthen the monitoring system.

Moreover, each local government established Local Disaster and Safety Management Headquarters led by the heads of the local governments to secure an adequate number of Infectious Disease Hospitals and beds. It was also decided by the respective government that in case, if the countermeasure required is beyond the capacity of local governments, then the central government may support necessary resources including beds, personnel, and supplies.

Greece

According to the (Reuters, 2020), the Greek government, as a precautionary measure had closed one of the schools and had traced and quarantined those people whom the first patient had come into contact with. However, how the Greece has handled the pandemic with limited resources is noticeable. According to (Ferdinando Giugliano, 2020) the government (of Greece) imposed severe social distancing measures at a much earlier stage of the epidemic compared to other southern European countries. The swift reaction has helped Greece in avoiding the tragic healthcare crisis that richer states are facing. Athens closed all non-essential shops only four days after its first Covid-19 death. A ban on non-essential movement in Greece came only a week afterwards. The Greek government also says it has recruited 4,200 new doctors and increased the number of ICUs by more than fifty percent of initial capacity, which should help contain a worsening of the outbreak. It is also opined that the Greek population appeared to be very mindful of respecting the lockdown rules which can be attributed to the government's steep penalties for non-compliance.

IV. STRENGTHENING OF HEALTH SYSTEMS BY FEDERAL GOVERNMENT

The Federal Government of Pakistan had taken multiple steps on multiple fronts to control the spread of COVID-19. The Federal Government's strategy was focusing on mitigating both the public health and socio-economic impact of COVID-19 pandemic and the halting of economic activities.

Formation of National Command and Operational Centre

National Command and Operational Centre (NCOC) was operationalized on the 26 March 2020 as it celebrated its 100th day on the 3 July, 2020 (Geo, 2020). NCOC, which serves as the nerve centre for acting upon COVID-19 and its related problems; recommendations based on information/ data are processed including health, finance, and all matters related to COVID-19 to NCOC for real time projections and timely interventions by NCOC. The NCOC is headed by the Prime Minister himself. With the formation of NCOC in end of march, and being fully functional since April 3, 2020, NCOC has been able to galvanize support to COVID-19 response teams across Pakistan. NCOC has been evaluating daily situation, and based on it; has been imposing and easing lockdowns, defining SOPs for workplaces and overall steering the course of COVID-19 in Pakistan. NCOC has been instrumental in handling COVID-19 disease outbreak in Pakistan. From planning a smart lockdown to Community Mobilization to Prime Minister's relief fund to Ehsaas emergency cash program – NCOC really plays a pivotal role in tackling the COVID-19 crisis in Pakistan. At various instances, NCOC has been instrumental in expeditiously procuring necessary items to tackle COVID-19 in

Pakistan. In April 2020, the NCOC, along with monitoring situation and making tough decisions, focused on procuring different items of Personal Protective Equipment ranging from masks, gloves, face-shields to production of ventilators to disinfectants. It was also the brainchild of NCOC to form the national strategy of Trace, Test and Quarantine. Management of patient load, distribution of equipment and future projections are all evaluated and handled by the NCOC. The NCOC comprises of both the civil and military leadership of Pakistan.

Improving Economic Situation

Throughout the world, economies have been badly hit by the COVID-19. Pakistan's economy also got badly affected by the pandemic and is still struggling to grow with numerous challenges. According to (Ministry of Planning, Development and Special Initiative, 2020) Pakistan's economy which was already suffering from low growth due to "macroeconomic imbalances and subsequent stabilization program" has been hit by COVID-19 during the last quarter of 2019-20. The economic growth declined historically to *- 0.4 percent*. Activity in the manufacturing and services sector, like rest of the world, is adversely affected. It has adversely hit around 100 million daily-wage workers during lockdown enforced to control spread of COVID-19 pandemic.

Governments, both federal and provincial, attempted to provide the best health services to Corona patients, with limited resources in order to save precious lives. Government also launched a number of initiatives for poverty-hit vulnerable segments of the society by providing direct financial assistance of Rs200 billion, payment of electricity bills, deferment of rents, loans instalment, cheap credit/ refinance, lowering of policy rate to 8 percent and gradually opening the labor intensive and export related sectors of economy to save livelihoods and revitalize the economy.

Improving Health Situation

The Federal Government is committed to achieve Universal Health Coverage (UHC) with focus on health reforms and preparedness for COVID-19 as priority. All measures are being taken to improve patient-care in hospitals and ensuring availability of healthcare service providers at all levels of health care system. Federal and provincial governments are engaged in developing strategic partnerships for technical and institutional capacity-building, UHC goals and pandemic preparedness. A context specific essential package of health services considering burden of disease and cost effectiveness of interventions is being designed in alignment with Disease Control Priorities defining services at:

community level

health centers' level

first level hospital

referral level hospital

population based.

With COVID-19 outbreak, all the focus was diverted to prevent, control and respond with measures which included movement restrictions of millions with complete shut-downs, establishment of comprehensive point-of-entry protocols, establishment of 294 quarantine facilities with 139,558 beds, arrangement of surge capacities for hospitals by identifying 566 hotels with 16336 beds; establishment of 217 isolation facilities with 119,778 beds for case management; engagement of medical and nursing students, local production of personal protective equipment, establishment of

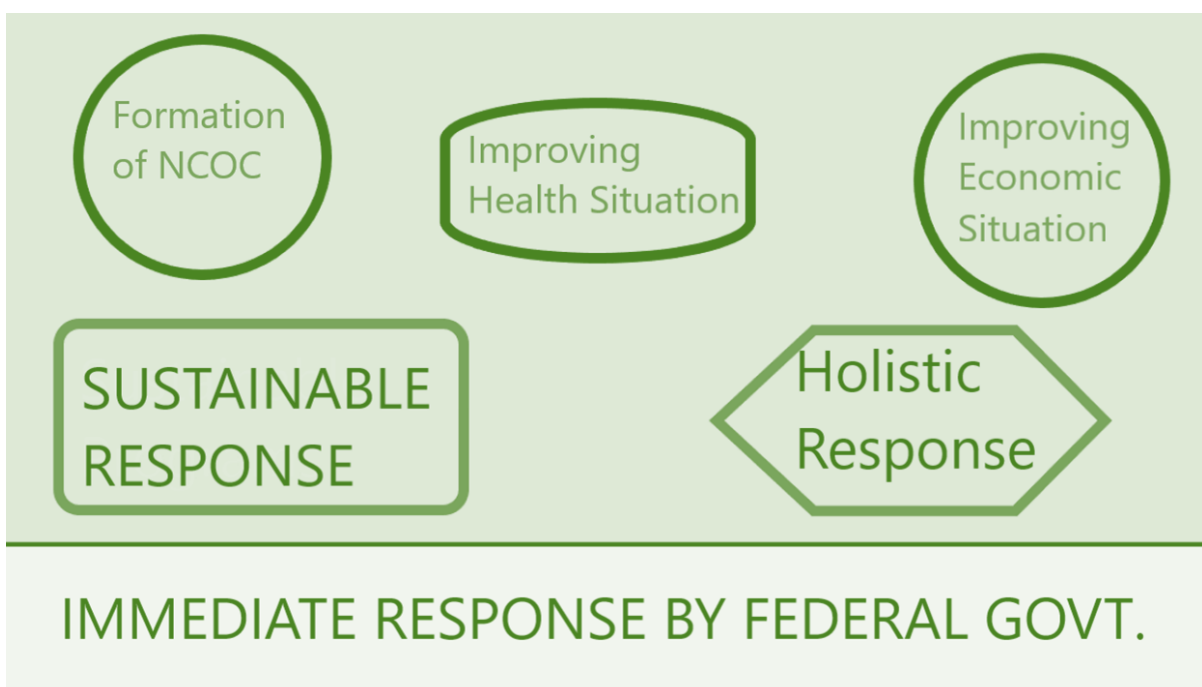
COVID-19 helplines and information portals overnight to ensure timely communication to the public (Ministry of Planning, Development and Special Initiative, 2020).

Sustainable Programs

As stated above, the development programs initiated by federal and provincial governments focus on developing strategic partnerships for technical and institutional capacity-building, are all aligned with SDGs to achieve Universal Health Coverage and respond to the COVID-19 related systems challenges deploying interventions for strengthening clinical management, infection prevention and control including provision of PPEs to frontline health workers; availability/sustainability of laboratory diagnostic capacity, biosecurity/ biosafety; surveillance; reporting; health workforce preparedness; emergency response; risk communications; and bolstering points of entry.

Holistic Response by The Federal Government to Tackle Pandemic

The national response has been coordinated with health and national security working hand-in hand. This was critical to integrate health system and other sectors to amplify the national capacity to absorb and adapt to the COVID-19 shock. Makeshift institutional arrangements like National Command & Control Centre (NCOC), National Coordination Committee (NCC) and Task Forces were established by the National Security Committee with supporting structures at provincial levels with multi-sectoral representation. This was critical due to the pandemic's sphere of impact expanding far beyond health, social systems and economies. Several emergency measures were undertaken to fortify the health systems by the federal and provincial government to limit the spread of the virus in face of the rising cases of COVID-19 suspects and confirmations. Surgical and N-95 masks, gloves, PPE gear, PCR testing kits and thermal guns have been procured urgently and stockpiles are being maintained foreseeing the expected exponential price hike in the next few weeks due to global shortage and demand. Donations of equipment and supplies through partner organizations and development partners have been secured. The National Institute of Health acquired the requisite capability for COVID-19 diagnostics on 1st February 2020, 26 days before appearance of the first case in the country, with the current daily national testing capacity standing at 2500-3000 tests through 18 laboratories nationwide (Ministry of Planning, Development and Special Initiative, 2020).



However, cumulative daily national testing capacity according to (National Command and Operations Centre, 2020) is 71,780 tests as of 23rd July, 2020.

V. GOVERNMENT OF SINDH'S RESPONSE TO COVID-19 IN TERMS OF STRENGTHENING HEALTH SYSTEMS

The Government of Sindh has been lauded for its timely and bold actions not just nationally but internationally by various leaders. It has been due to instrumental leadership of honorable Chief Minister Murad Ali Shah's that despite the highest number of cases of COVID-19, the province of Sindh has the lowest mortality rate, in comparison with KPK and the Punjab.

Immediate Response by the Sindh Government

According to Budget 2020-21 of Government of Sindh (Shah, 2020), the Government of Sindh followed the universally adopted approach to address the threat posed by COVID-19. Sindh was the first province in Pakistan to take steps for enforcing and implementing a lockdown. Steps were taken as soon as the first case surfaced on 26th February 2020, and schools were immediately closed to protect the children, as mentioned earlier in this report. The Sindh government moved towards closing down all places where people could gather, and a lockdown was imposed on 23rd March 2020 and continues to remain in force in certain domains. Other provinces followed suit and gradually, the rest of the country also imposed a lock down. The Government of Sindh did not rely on a lockdown alone. The provincial government diverted its resources towards providing better health facilities, and towards supporting the common man facing a potential meltdown with relief efforts, as economy came to a near standstill as a result of an imminent national lockdown.

High levels of testing, Establishment of Isolation Centers & Generation of Funds

With regards to best practices, WHO has been recommending to all countries to increase their testing so that positive cases can be separated from the negative ones. Therefore, Corona testing capacity has been enhanced to from 80 tests per day to 11,450 per day in the province of Sindh. To cope with extraordinary situation arising out of COVID-19, Health Sector, being the frontline service provider, expeditiously initiated steps to make necessary arrangements to avert big human disaster. 81 isolation centers in all districts with 8,266 beds capacity were established. By June, 2020 this capacity was increased to 8,616. For ensuring timely supplies and proper service delivery, Government of Sindh constituted Medical Procurement Committee. This Committee procured Personal Protection Equipment, Laboratory Items and Equipment and other essential Machinery, Equipment and Instrument worth Rs.2.43 billion, which includes expenditure of Rs.1.5 billion under Corona Emergency Fund and Rs.891.8 million from PDMA Fund. In addition to existing ventilators, 101 more ventilators were procured on need basis for public health sector facilities with 250 monitors to ensure timely availability of life saving services to critical patients.

Moreover, to enhance the public health care system, a number of projects are in process and many have been completed, such as infectious Diseases Hospital at NIPA Chowrangi, Karachi was supported with Rs.2.0 billion through a Grant in Aid.

Looking at The Economic Front

Government of Sindh also focused on addressing the social and economic impact of coronavirus, due to which a large segment of low-income groups were affected owing to slowed economic activity. In order to ensure that this marginalized segment of our society is looked after with dignity, Government of Sindh released over Rs.1.08 Billion to all Deputy Commissioners of the province for ensuring that rations reach the needy at their doorsteps.

Health Specific Initiatives in Government of Sindh's Budget 2020 - 21

Health continues to remain the third largest sector with allocation for Current Revenue Expenditure of Rs.120 billion and Development, including Foreign Project Assistance at Rs.15.5 billion in financial year 2019-20. In next financial year 2020-21, total Current Revenue Expenditure is budgeted at Rs.139.1 billion while allocation for development schemes is Rs.23.5 billion. The COVID-19 virus has created a National Health Emergency and Provincial Government have taken essential measures to improve the Health care system in the province. The budget allocation for Health department (excluding medical education) in current revenue expenditure has been enhanced by **16.1%** from **Rs.114.44 billion to Rs.132.88 billion** in the next FY 2020-21. The budget of Health Department is divided into two major segments i.e. Health Services and Medical Education. The budget estimates for Health Department for financial year 2019-20 was Rs.120.486 billion which has been increased to Rs.139.178 billion for the next financial year 2020-21.

Focus on Overall Health Sector

While it is pertinent to tackle COVID-19 at present, it is the responsibility of the government to take into consideration other diseases too. Therefore, Rs.7.0 billion have been allocated in next financial year 2020-21 for 09 vertical Programs to combat/control Polio (which despite having vaccination, unfortunately only exists in Pakistan and sometimes in Nigeria and Afghanistan), TB, Aids, Lady Health Worker Program, Hepatitis control, expanded program for Immunization and others. These Programs have also been shifted from development to regular budget in next financial year 2020-21. Main features include Rs.559.4 million for TB Control Program in Sindh, Rs.5.5 billion are allocated for a multi-sectoral Accelerated Action Plan for reduction of stunting & malnutrition in various departments including health. Rs.1.2 billion for Lady Health Worker (LHW) Program, Rs.1.9 billion for Prevention & Control of Hepatitis in Sindh, Rs.267.9 million for Maternal, Neonatal and Child Health Program in Sindh, Rs.2.3 billion for EPI Program Sindh, Rs.1.0 billion for 200 Bedded Infectious Disease Control Hospital at NIPA, Karachi, Rs.1.0 billion, Rs.1.0 billion for upgradation and operationalization of newly completed 22 Health facilities, Rs.234.6 million for upgradation of Health care services for Lyari General Hospital Karachi and Rs.521.1 million for taken over health facilities of Proscribed organizations in Sindh.

Development for Health Sector

During current financial year 2019-20, Rs.4.0 billion had been allocated as Special Grant for Indus Hospital Karachi. Out of this Rs.2.0 billion is for its current operation and Rs.2.0 billion for Expansion of Indus Hospital. Rs.1.5 billion has been allocated for Purchase of plant and machinery in existing health facilities in Sindh and Rs.250.0 million has been allocated for purchase of furniture and fixtures for health facilities in Sindh. Moreover, Rs.5.1 billion has been allocated to NICVD, Karachi, Rs.5.1 billion has been allocated to SICVD (Lyari Karachi, Larkana, Sehwan, Hyderabad, Sukkur, T.M.Khan, Shaheed Benazirabad, Khairpur, Mithi and Karachi), Rs.2.5 billion has been adopted for PPP Node Health department, Rs.3.6 billion has been adopted for the Institute of Pir Abdul Qadir

Shah Jillani, Gambat, Rs.300.0 million has been allocated to Institute of Ophthalmology & Visual Sciences Hyderabad Rs.600.0 million is allocated for Jacobabad Institute of Medical Sciences, Rs.1.7 billion has been allocated for SMBB Trauma Centre Karachi, Rs.300.0 million has been allocated for Shahdadpur Institute of Medical Sciences, Rs.5.6 billion has been allocated to SIUT, Rs.6.5 billion has been allocated to PPHI Sindh, Rs.500.0 million has been allocated to NIBD, Rs.900.0 million has been allocated for Child Life Foundation, Rs.100.0 million has been allocated for Institute of Physical Medicine and Rehabilitation Karachi and Rs.365.0 million has been allocated to Health Care Commission, Karachi.

Grant in Aid

Grant in Aid for various health activities in Health Department Secretariat has also been proposed for the next financial year 2020-21. Main allocation include Rs.312.0 million as Grant-in-Aid for Remuneration of Polio Workers in Sindh, Rs.200.0 million for Grant-in-Aid for Kidney Center Karachi, Rs.431.1 million as Grant-in-Aid for Medicine of Blood Cancer Patients, Rs.160.000 million as Grant-in-Aid for Treatment of Thalassemia in various Health Facilities of Sindh, Rs.73.6 as Grant-in-Aid for ANF (MATRC) Centers (Karachi, Hyderabad & Sukkur), Rs.80.0 million as Grant-in-Aid for Strengthening of Chemico Bacteriological lab at Karachi & Sukkur, Rs.100.0 million as Grant-in-Aid for Cancer Foundation. Rs.383.8 million as Grant-in-Aid for Extension of CML Project for other Cancer Diseases, Rs.150.000 million as Grant-in-Aid for Dialysis in various Health Facilities of Sindh, Rs.100.000 million as Grant-in-Aid for Fatimid Foundation Sindh, Rs.1.0 billion as Grant-in-Aid for Endowment for Welfare of HIV Aids Patients, Rs.121.1 million as Grant-in-Aid for NIMRA Jamshoro, Rs.100.0 million as Grant-in-Aid for Nigahban to maintain Surgical Unit at Civil Hospital Karachi, Rs.150.0 million as Grant-in-Aid for Patient Welfare Association Karachi, Rs.250.0 million as Grant-in-Aid for Thar Foundation for establishment of Hospital @ Islamkot and Rs.183.6 million as Grant-in-Aid for Purchase of Hepatitis B Vaccine (Birth Dose) (Shah, 2020).

Planning & Development Board Sindh financed 174 Health Sector schemes in Annual Development Plan (ADP) 2019-20 with total cost of Rs15,511.08 million for various ongoing and new schemes including expansion and upgrading of 3 THQs and 4 DHQs, establishment of medical college and child health care institute. There was a setback with recent outbreak of more than one thousand new HIV cases in Larkana district, the situation being declared by WHO as a "Grade 2 Emergency" requiring urgent need of Anti-Retro Viral medicines, Rapid HIV Diagnostic Kits (RDTs) and strengthening of Infection Prevention and Control at Health Facilities. The require funding gap of Rs195 million was pledged by Global Fund (Ministry of Planning, Development and Special Initiative, 2020).

To cope with alarming situation arising out of COVID -19 Pandemic, Health Department, being the frontline service provider, expeditiously initiated timely steps to make all necessary arrangements to avert a colossal human disaster. In this regard, so far 81 Isolation centers (15 in Karachi and 66 in rest of Sindh) with 8266 beds capacity (1818 beds in Karachi & 6448 in rest of Sindh) have been established in Sindh and by June, 2020 this capacity has been increased to 8666 beds (2068 in Karachi & 6598 in rest of Sindh). In terms of COVID-19 Specific Hospitals, Sindh Infectious Control Hospital is completed and operational with 178 beds near NIPA Gulshan-e-Iqbal, Karachi. Similarly, a 50-bedded Hospital is operational at Gulistan-e-Johar (Karachi). Sindh Infectious Control Hospital will be institutionally be linked to 50 Bedded Hospital at Gulistan-e Johar and operated under Dow University of Health Sciences, Karachi.

In addition, in coordination with Provincial Disaster Management Authority (PDMA), necessary arrangements to increase the capacity of existing hospitals would also be ensured through provision of ventilators, laboratory items, other essentially required machinery/ equipment, skill-

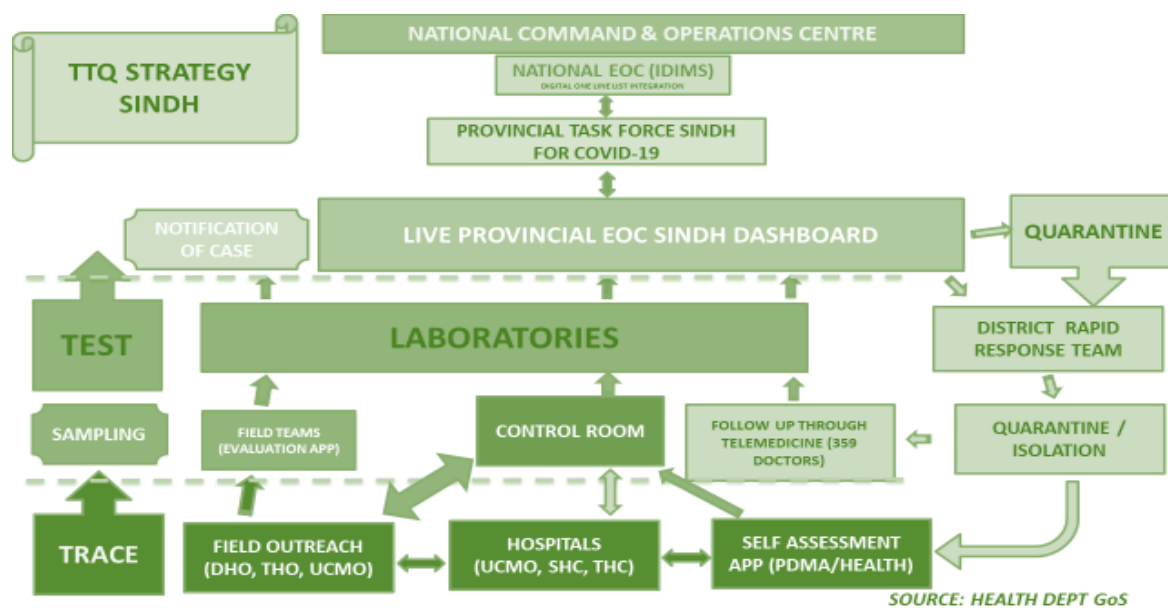
based capacity building, recruitment of additional human resource etc. Furthermore, COVID-19 & Infectious Control-related development initiatives have also been included in ADP 2020-21:

- Establishment of 6 infectious diseases control hospitals at divisional level (estimated cost of Rs. 10 billion)

- Addition of Bio-Safety Labs at 7 Teaching Hospitals (estimated cost of Rs. 245 million)

- Upgradation of labs at 18 DHQ Hospitals (estimated cost of Rs. 540 million).

GoS has also set aside Rs. 5 billion as COVID-19 Emergency Fund for extenuating circumstances pertaining to the pandemic.



VI. WHAT HAVE BEEN THE BEST PRACTICES AND WHERE? WHAT HAVE COUNTRIES DONE TO SUCCESSFULLY GET OUT OF PANDEMIC?

Best practices can be defined as those practices which have resulted in flattening the curve of COVID-19 cases. Most of the countries are still grappling with the impact of COVID-19. However, a few countries were able to limit the spread of disease initially and curb its transmission. Mostly, those countries that were able to effectively respond to COVID-19 were resource rich and had populations who adhered to the advisory of their governments such as Singapore, Japan, Qatar and New Zealand. However, a few countries such as Vietnam and Greece have controlled the spread of disease with limited resources. Pakistan as of now, can be considered as a country (considering its highly dense population and low healthcare resources) which has to a great extent limited the spread of disease through strategies of testing, tracing and quarantining, smart lockdowns and effective communication from various governmental bodies.

New Zealand

According to (Health Department, Government of New Zealand, 2020), on Monday 23 March, the Prime Minister issued an Epidemic Notice under section 5 of the Epidemic Preparedness Act 2006. This was based on advice received from the Director-General of Health in response to the increasingly complex and far-reaching response to COVID-19. This Government had chosen to go hard and go early in the response to COVID-19 for public health reasons. The package of measures introduced since 14 March have helped New Zealand take a precautionary approach to managing COVID-19.

It is argued that New Zealand could easily control the spread as its population is insignificant in comparison with other countries where the governments have been unable to limit the spread for instance Brazil, India, or even Pakistan. Although there is merit to the claim that populous countries with limited resources face a bigger challenge in combating COVID-19 outbreak, the effectiveness of strategies adopted by New Zealand cannot be undermined. On the contrary, there is China, who with controlled the pandemic not to spread in their own country despite the world's largest population. On the other hand, there is United States of America, which despite having top notch equipment, expertise and near-to-unlimited resources could not control the disease and has the greatest number of cases. Therefore, the ingredients for New Zealand to limit less than 2000 cases and less than 30 lies beyond good resources and easy-to-manage population.

According to (DW, 2020), New Zealand had a swift and tough implementation of lockdown. According to New Zealand's Prime Minister, it was necessary for them to go hard and be early in action. On March 15, when New Zealand had only 100 confirmed cases and no deaths, it closed its borders to foreign travelers and made people coming home quarantine for 14 days. Then 10 days later, it introduced full lockdown measures, which were strict by international standards. Only grocery stores, pharmacies, hospitals and gas stations could stay open, vehicle travel was restricted, and social interaction was limited to within households. Those restrictions lasted for over a month before they were slowly eased again.

In addition to it, the rules were effectively communicated. Shortly before the strict lockdown, the government sent emergency text messages to residents. "This is a message for all of New Zealand. We are depending on you," it read. "Where you stay tonight is where you must stay from now on ... it is likely [the strictest] measures will stay in place for a number of weeks." The government got its messaging right.

Along with effective communication, the country ramped up its testing capacity. The country could process up to 8,000 tests per day, one of the highest testing rates per capita in the world. In total, it has tested just under 295,000 people, again giving it a comparatively high per capita rate of testing.

Moreover, New Zealand had advantage of its geography. The country being a relatively isolated island greatly helped New Zealand's pandemic response. The country had more control over who can enter than other countries with large land borders. And due to its relatively low population density, meant that the virus could not travel as easily through the population, as fewer people encountered each other.

Lastly, New Zealand's government was following the best guidelines for dealing with a new virus. All the guidelines provided were religiously followed which although gave them an initial bump in their economic activity. But the same bump allowed them to prepare themselves.

Republic of Singapore

The government of the Singapore had scaled up the national “Disease Outbreak Response System Condition” (DORSCON) alert level from green to yellow (Level 2 out of 4-level national crisis management system) on 21 January 2020. The Singapore health authority had strengthened surveillance for pneumonia cases in health facilities nationwide since 3 January 2020. Medical circulars had been disseminated to all registered medical practitioners informing them of the suspect case definitions, to notify the health authorities and isolate any suspect cases, and information on the first confirmed case. Border screening measures had been implemented for flights arriving from Wuhan at the international airport since 3 January 2020. Border health measures were further enhanced on 22 January 2020 with the expansion of temperature screening measures to screen all flights from China. Health advisory notices and posters had been issued and put up as well. Intensified border screening had expanded to land and sea checkpoints. Public risk communication had been enhanced including the emphasis on social responsibility and personal hygiene practices. Contact tracing and other epidemiological investigations are still underway (World Health Organization, 2020).

VII. STRATEGIC POLICY PRESCRIPTION IN TERMS OF STRENGTHENING HEALTH SYSTEMS TO ADDRESS PUBLIC HEALTH AND SOCIO-ECONOMIC IMPLICATIONS OF COVID-19

The existing health systems in all parts of the world were not prepared for this pandemic – and surely most of the countries’ health system was overwhelmed and collapsed. Similarly, Pakistan’s existing health system was at a risk of being overwhelmed due to the novel coronavirus. Therefore, lockdown was necessary to equip oneself for the outbreak of a disease. Investments in health is a credible instrument to gauge whether a country places healthcare as its development priority or not. According to (World Health Organization, 2016), Pakistan’s total expenditure on health as a % of GDP stands at mere 2.6 %, whereas neighboring India stands at 4.7 %, Bangladesh stands at 8 %, Turkey stands at 5.4 % and Egypt at 5.6 %⁷. This shows Pakistan spends very less on health as % of GDP with regards to other countries. Similarly, in Pakistan probability of dying under five (per 1000 live births, 2018) was 69 which is greater than most of the countries.

The health care system was devolved as a provincial subject after 18th amendment – and though provinces have established their health departments into primary, secondary and tertiary, the existence of facilities is not equal everywhere. It was in 2014, that Sindh Healthcare Commission came into being. Sindh Healthcare Commission bill was passed with an aim to make provision for improved access, equity and quality of healthcare services, to ban quackery and to provide for ancillary matters. The various domains included through this bill were governance, registration and licensing, standards of healthcare services, inspection and enforcement and funds, budget & accounts. (Khan S. A., 2019) argues that though the Punjab and KPK have improved, the gap is still prevailing in healthcare service delivery in both Sindh and Baluchistan at rural and urban settings, as he explains that restructuring of public health facilities, expanded focus on primary health care, integration of developed national public health programs, bridging of population health gap, and

⁷ These figures are from www.who.int/countries and are of 2014

reformed hospitalization through decentralization is absent in the province of Sindh and Balochistan.

Best Practices Across Countries



Similarly, (Khan S. A., 2019) further argues that in terms of health finance, Sindh lacks progressive and innovative revenue mobilization along with fiscal and debt limitation to create fiscal space, increase in health revenue allocations, and revamping of government's existing system.

According to (Government of Sindh, Health Department, 2020), the Sindh Department of Health currently has more than 14,000 Doctors 2,000 Nurses and over 12,000 paramedics serving all over the province. The province has two medical universities; one each at Karachi and Jamshoro, and three medical colleges; one each in Sukkur, Nawabshah and Larkana, 12 Nursing School, 10 Midwifery Schools and 5 Public Health School for lady health visitors. The huge network of hospitals and health facilities include 6 teaching hospitals, 5 specialized institutions for chest, dermatological and mental illness, 11 district headquarters hospitals, 27 major hospitals located in the major cities, 44 Taluka hospitals, 99 Rural Health Centers in small towns, 738 basic health units in Union Councils, 305 dispensaries in larger Union Councils, 36 MCH Centers 12 maternity Homes and 39 centers for traditional medicine. The rural health centers provide specialist care in the morning hours in addition to minor emergency services and have indoor facilities that are seldom utilized, while the BHUs and dispensaries provide outdoor medication and preventive care till 2 pm. The Rural facilities are usually ill equipped, under-staffed, and under-utilized.

According to (Chaudhry & Khan, 2020) strengthening Pakistan's health system requires strategic reorganization of healthcare delivery consistent with community needs, elevation of preventive and promotive healthcare strategies, and targeted investment in different core system components. The authors note that service delivery, financing, capacity enhancement, public policy and legislation, governance and leadership and digital transformation can lead to strengthen Pakistan's health system. There is a need to prioritize funding to design technically sound intervention and monitor results that are geared toward effective and equitable targets. It is important to engage the private sector to complement public sector efforts. (Chaudhry & Khan, 2020) further write that several studies indicate that private healthcare delivery is significant not just from a healthcare standpoint

but also from an economic perspective. However, it is important to note that models of private sector contribution have to be designed and structured with careful consideration. Private providers, being market-driven actors, are heterogeneous in their objectives, size and quality, and need to be aligned to respond appropriately to challenges and opportunities. Policies must evolve to be reflective of needs and requirements of the health sector and cater to the complexity of private sector contribution.

Shedding light on the importance of public sector, (Chaudhry & Khan, 2020) argue that public sector should make an effort to calibrate its focus to improving the regulatory framework, national policy setting, disaster management and coordination, guiding financing mechanisms and setting standards for quality and patient safety. Through policy frameworks, it should define and support the role of the private sector. This will not only enable the private sector to have a clear mandate to provide safe, efficient and effective healthcare but also help the public sector concentrate on the lower socioeconomic strata of society and ensure a minimum service package can be provided for every citizen. It will provide a platform for objectively assessing standards across the country and build a systems approach to formally develop the healthcare industry – essentially contributing to the economic growth.

While writing about health financing, (Chaudhry & Khan, 2020) write that around the globe in 100 countries have health financing systems that are predominantly funded through general taxes and another 60 have payroll tax based MHI systems. Only a few countries have private health insurance financed systems (e.g. the United States). In practice, however, most countries have mixed models. Incentives should be provided to institute a third-party payment system, which can help with the risk pooling, universal definition of essential benefit package and employer/employee protection. A federal body should be mandated to provide guidance, resources and frameworks to develop the healthcare insurance industry in Pakistan.

Additionally, (Chaudhry & Khan, 2020) argue there is a need for Public Policy and Legislation, which includes, investment-friendly environment and Public Private Partnership Framework. Similarly, with regards to governance and leadership, decentralization, inter-sectoral action & inclusive involvement is needed. Therefore, for critical success, the authors point out continuity of political support and strategic investments, alignment with social and demographic needs, availability of evidence – which requires not just on ground field work for primary data but access to quality researches which are often costly for individuals.

Gaps Within the Existing Systems and Limitations for Success

Lack of Holistic Development

Biggest problem in the health system is of under development of areas. For any health system to be at par with international standards, overall holistic development is an essential pre-requisite. To assume that great health care facilities are going to exist in a remote village with no access to roads, running water, electricity and poor infrastructure is altogether is an unfair and unrealistic assumption. According to a report by (Institute of Health Policy and Development Studies, 2005), people's health is affected by the difficult access to health services.

Disparity of Available Facilities

There is disparity in terms of available infrastructure, medical supply, and personnel. While infrastructure is related to holistic development, the level of medical supply and personnel to an extent can be augmented and elevated. Ensuring adequate availability of medical supplies also needs extended coverage of roads and networks. Budgetary allocations and then budgetary expenditure need to be streamlined, from an equity perspective, so that there is an equal access to medical supplies. However, personnel are again limited to the development of area. As (Adam Fusheini, 2016) point out, that *lack of amenities such as schools, recreational facilities and accommodation for staff as well as the intermittent power failures have negatively impacted the functioning of equipment and care of drugs and medical consumables that need to be stored in refrigerator*. They further argue that *budgetary constraints, which is not peculiar to one province has impacted on the rollout of certain services*. A highly qualified and skilled doctor or paramedic would not leave his/ her hometown, unless he/ she is provided adequate accommodation, transportation and good remuneration. Unless all areas have an adequate level of infrastructure, production and social sector development, healthcare disparity would persist.

Lack of Personnel (Both Quantity and Quality)

As discussed above, personnel in terms of both quality and quantity are required for efficient functioning. Therefore, allocation and expenditures should not only be spent but also be continually increased. Even when there is an infrastructure of the health care facility – it has to be manned by educated health professionals. (Chaudhry & Khan, 2020) write that human resource deficiencies in the sector and growing unmet demand for quality care has in fact increased the burden on health care. A country like Pakistan, which has limited resources with an overgrowing population – faces challenges at every level. However, this growing population can be positively harnessed by effective state policies to benefit the quantity of human resources lacking in our health care systems.

Healthcare Training Facilities/Institutions

As (Nishtar, 2010) writes that with the making of Pakistan, there had been a focus on medical colleges and thus producing doctors. However, with regards to paramedic training institutes, there has been meagre development. It is further argued that only after many years, it was Aga Khan University which started training nurses. For a long time, it was only Armed Forces Institute of Nursing and Aga Khan University School of Nursing. Similarly, it is common to see that many doctors have graduated from Pakistan, prepare and leave for foreign countries thus contributing to the brain drain. Inadequate number of trained paramedics has severely plagued the healthcare system of the country. Although the country is investing in paramedics training and has been able to develop a considerable network of lady health workers for outreach activities, there is a lot that needs to be done to institutionalize and oversee the recruitment, training and continuous capacity development of the paramedics.

Responsiveness to Public Health Emergencies and Disasters

Like it did in many parts of the world, the pandemic exposed the inadequate health systems responsiveness to emergencies and disaster situations. Responsiveness does not only mean getting real-time data, but also having institutional arrangement to utilize that data for effective response to the emergent situations. For example, in Sindh's context, having a 'District Health Information System' that provides basic health facility-level disaggregated data is beneficial. However, the data system alone is futile without active surveillance systems that pre-emptively act upon spikes in cases

of a disease to control and contain the outbreak. In times of emergencies and disasters, we see the concept of 'sector blurring' where non-government organizations (NGOs) are on the forefront and more systematic in their response as compared to the government. Our health system cannot afford to continue with a 'knee-jerk' reaction to every emergency and disaster.

Recommendations to Strengthen Public Health Systems

For any public health system to thrive, it is necessary to have adequate funding and resources. Adequate resources can go a long way in strengthening the public health human resources. Human resources are not restricted to qualified doctors or nurses only. Well-rounded professional administrators are also required who can administer the workforce effectively and ensure retention with performance-based incentives. Similarly, as there is a lot of burden on the already overwhelmed health system, it is necessary for the public to be aware of communicable and non-communicable diseases for prevention through community mobilization.

Simple hygiene practices which have been hugely promoted by health officials for COVID-19 can and would result in lesser number of communicable diseases. Likewise, a good healthy lifestyle which includes exercise, healthy food and stress-free lives can result in reducing the number of non-communicable diseases. Therefore, in order to strengthen the health system of Pakistan, it is necessary for the public to practice healthy lifestyles which essentially entails focusing on pro-active preventive measures in addition to the curative side of healthcare. Other than what has been mentioned above, following points should be given importance:

Strengthening Primary, Secondary and Tertiary Health Facilities

The public sector delivers healthcare through a three-tiered delivery system and a range of public health interventions. Despite the significant role played by the private sector, the government is still the largest institutional provider of health infrastructure in the country. Basic Health Units (BHUs) and Rural Health Centers (RHCs) form the core of the primary healthcare structure. Secondary care – including first and second referral facilities providing acute, ambulatory and inpatient care – is provided through Tehsil Headquarter Hospitals (THQs) and District Headquarter Hospitals (DHQs), which are supported by tertiary care from teaching hospitals (Chaudhry & Khan, 2020). A healthy and functioning healthcare delivery system mandates mutually supportive and symbiotic relationship and integrates primary, secondary and tertiary care. Such integration and several strategies could be planned and implemented to improve healthcare delivery system of Pakistan. It is necessary that there is a shift from curative biomedical model towards more extensive and holistic approach. Simultaneously, socio-cultural and environmental aspects need to be addressed to improve the health of the people. A decentralized system where districts are delegated powers would result into ownership and responsibility thereby, improving service delivery. An adequate amount of allocation of funds should be targeted towards capacity building of administrators at district levels. There should be representation of stakeholders in policy making. Other key measures can be taken to improve Healthcare sector of Pakistan; control population growth, increase literacy rate, increase health budget, control corruption in public health projects, regionalization of Healthcare services, and promote health education, proper check on quackery and exchange of human resource and knowledge with developed countries (Hassan, Mehmood, & Bukhsh, 2017).

Harnessing Public-Private Partnership to Improve Service Delivery

Clear deliverables and a partnership model between the government and private providers can bring efficiency to the system and increase value for all stakeholders by ensuring aligned provision of services in an equitable manner (Chaudhry & Khan, 2020). The authors further note that partnership with the private sector can provide an opportunity to contribute by combining resources, aligning the supply chain and provide missing services for communities. This will help mitigate the current focus on building large-scale facilities that span across all levels of care with a mixed result in improving overall population health. It will also open avenues to provide security to current employees in the public sector to work across both private and public sectors and learn new skills to enhance their contribution. Structuring of contracts, particularly financial and transactional modalities like reimbursement methodologies, should consider the challenges of capital deployed by private actors which is driven by shareholder value. A transparent, fair and comparative formula for return on capital should be devised to level the playing field for factors like subsidies that are exclusive to the public sector. Similarly, results-based framework (RBF) and disbursement-linked indicators as instruments of performance management guiding PPP rather block grants should also be incorporated in harnessing Public-Private Partnership to Improve Service Delivery.

Leveraging Information, Communications and Technology for real-time data on diseases (electronic surveillance, M&E systems, etc.) for informed decision-making Digital transformation is a key enabler to deliver effective and efficient care across various population segments. It spans across patient-centric technologies to system-process oriented usage to increase efficiency. Innovation is key in adapting different levels of digital transformation across a delivery system. Recent experience with Covid-19 has highlighted the criticality of digital technologies to maintain access to care despite infection control challenges.

Spending on medical technology accounts for high investment and ought to be properly planned based on an optimal balance of cost-benefit to achieve the desired outcomes. These are areas in which the private sector interest can bring value, since it provides lucrative investment opportunities and mutually beneficial solutions (Chaudhry & Khan, 2020). Another example of innovation is telemedicine, which is utilising existing technology to bring innovative and affordable approaches to healthcare delivery in Pakistan. Public programmes such as the Government's Covid-19 Health Advisory Platform and Telehealth platform and private programmes, such as Sehat Kahani, provide mobile-based telehealth solutions. They leverage the high levels of mobile penetration across Pakistan and, through partnerships, connect underserved communities with qualified medical practitioners for telephonic or virtual consultations.

Mobile technology also has the capacity to reach underserved communities with general preventative health information in easily understood formats given the country's illiteracy challenges. With private sector investment and partnerships, telehealth and telemonitoring programmes can improve communications to increase outreach of public health promotions and behavior-change initiatives (Chaudhry & Khan, 2020).

Vertical and Horizontal Integration

(Federal-Provincial, Integrated Infectious/Communicable Diseases Facilities, Etc.)

As (Chaudhry & Khan, 2020) argue fragmentation through systemic misalignment of incentives and lack of coordination within and among institutions has led to inefficiencies – Impacting quality, cost and outcomes, and reinforcing the need for improvements in integrated care. Therefore, authors opine that data should be expanded to include public and private service provision. There should be strong consolidation from provincial DHIS and other vertical based systems to create a fully

functional integrated national healthcare system Allocative and technical efficiency in terms of resources; not just budget increments (invest in high-impact schemes) and work on effective resource mobilization

In expanding coverage to promote health outcomes and financial protection, countries need to raise enough and sustainable revenue efficiently and allocate it equitably to provide individuals with a basic package of essential services. Health spending has typically been outpaced by economic growth and is expected to continue this path. This necessitates financial sustainability to be a key factor from the outset by ensuring the extent of the challenge is diagnosed properly. Simultaneously, revenue sources must be broadened while containing costs through an appropriate use of resources. These revenue streams must be managed to pool health risks optimally (equitable and efficient) so that individuals are provided with “insurance” coverage against unpredictable catastrophic medical care costs (Chaudhry & Khan, 2020).

Strengthening and/or revitalization local governments to ensure quality healthcare service delivery at grass-roots level. Decentralization can be very effective in managing delivery of care with local support. It can bring decision-making closer to the communities it serves, better understanding of contexts and environments, and deepen the understanding of healthcare challenges, along with participatory policymaking. The extent of decentralization can be phased to align with local leadership and infrastructure development (Collins, 1988). Recent development in Local Government structures will have implications on how health services are designed, delivered and managed in provinces. It will be important to ensure that the implementation of new systems aligns closely with UHC goals and objectives.

The local government and social protection sectors play an important to support the health sector. The government can play a facilitating role in providing a platform to hold relevant conversations, while leveraging help from the semi-private sector eventually resulting in healthcare service delivery at grass-roots level (Chaudhry & Khan, 2020).

Responsive Public Health Emergencies and Disaster Responsive Institutions

Dedicated health and disaster management units are required to have a robust system of surveillance with an early warning system that predicts potential outbreaks. The information should be effectively utilized to contain any potential outbreak or epidemic. Predictive analytics can be used to pre-emptively identify high-risk populations in terms of potential infectious spread. However, it must be reiterated that technology, or lack thereof, is not a first-order problem when it comes to responsive health systems. Effective and efficient utilization of health information systems can go a long way in curbing the spread of communicable diseases. Addressing the problem from onset can significantly alleviate the burden of overbearing caseload from the existing health system. At the inception stage, these systems might require significant human resources, but as the processes are automated, the overall health information eco-system in Sindh can move to a more technical and leaner setup. Existing network of polio workers, lady health workers, community health workers and social mobilizers can be leveraged and expanded for any outreach efforts that are required to supplement the infectious control functions of health units. An integrated electronic database with real-time updates with public and private health institutions is the need of the hour because majority of country’s population seeks private healthcare. Partner Institutions, like Indus Hospital, are already well-equipped with end-to-end digital systems. Government can engage such institutions to not only improve the overall public sector health information systems, but also the capacity of human resources to effectively response to emergencies and disasters.

Political Leadership and Pro-Active Communication

The initial spread of COVID-19 in Pakistan went unnoticed due to lackadaisical approach towards border control and port quarantine. However, the political leadership of Sindh took prompt action when the health experts apprised them of the dangers of a laissez-faire approach towards a novel virus. Chief Minister Sindh quickly brought on key epidemiological experts on board to not only guide the public health efforts, but also oversee the expedited procurement of all the relevant equipment to tackle the pandemic. Similarly, esteemed and credible philanthropists were brought on-board to oversee the Corona Emergency funds utilization for transparency. The most critical component of provincial government's response to COVID-19 was its proactive communications with Chief Minister giving daily situation briefings on media himself. This apprised the community about the dangers of COVID-19 becoming an epidemic that could debilitate the fragile health system of the country. Quarantine, Isolation and Critical-Care facilities were expanded in a very short span of time based on rapid needs assessment. Lockdowns were also initiated to stem the tide of novel Corona during uncertainty, but NGOs were also engaged to ensure food distribution to households. All other provincial governments soon followed suit and the federal government constituted NCOC for inter-provincial coordination while closely monitoring the emergent situation. All the subsequent decisions were primarily made on real-time data analysis that culminated into a dynamic response mechanism with all the key stakeholders on a single platform. Essentially, Government of Sindh used epidemiological data to make crucial decisions to curb the tide of COVID-19. This evidence-based approach was soon followed by all other provinces and was then concretized at federal level in the form of NCOC. Careful evaluation of real-time data led to timely decisions pertaining to lockdowns while carefully treading on the precarious trade-offs of livelihood versus lives.

VIII. CONCLUSION

COVID-19 pandemic is a completely novel situation for the entire world, but Pakistan has distinguished itself in its response, given the resource-constraints it faces. The country's response to the first wave of COVID-19 was lauded and recognized globally. This should not result in complacency as the situation will be precarious until a vaccine is developed and is accessible to all in the developing world. With all the well-deserved praises garnered for the public health response and mitigating the socio-economic impact of COVID-19, the Federal and Provincial governments must critically assess the public health and disaster response systems within the country. A critical gap is the dearth of quality 'data systems' that can be used by the governments to effectively target the vulnerable segments of the population for health, economic or social protection programs. In emergencies and disasters, ad-hoc rapid needs assessment exercises have to be carried out to map the 'high-risk', 'needy' or 'vulnerable' segments of populations.

Strengthening of the 'data systems' should not be restricted to merely updating the national socio-economic registry. A dynamic end-to-end database has to be maintained and updated along sectoral lines by the government. For Government of Sindh, District Health Information Systems can be used as a frame of reference to develop a dynamic centralized database that also incorporates private sector facility-level data. This effort needs to be coupled with capacity building of the data-users and decision makers. Just like any dormant asset, unutilized data is a dead capital. To full realize the potential of data, a demand has to be generated from the system vis-à-vis evidence-based planning and policy formulation. Strengthening health systems to deal with both communicable and non-communicable diseases cannot and should not be restricted to increasing allocation of resources. Efficient resource utilization can only be realized if the decisions for health

systems strengthening are grounded in evidence. In Sindh’s context, the revision of ‘Sindh Health Sector Strategy (2012-20)’ must be undertaken with a focus on both public health emergency responsiveness, and effective operationalization and utilization of the data eco-system for evidence-based planning and implementation.

The following strategic action matrix delineates proposed actions that can be undertaken along the lines of service delivery, health financing, capacity enhancement, public policy & legislation, governance & leadership, and digital transformation to significantly improve health systems’ efficiency and effectiveness in the country and all provinces.

Strengthening Health Systems Strategic Action Plan Matrix					
S. No.	Indicator	Short-term action(s)	Medium-Term action(s)	Long-Term Action(s)	Department(s)
1	Service Delivery	Incorporation of Quality systems Improving facilities, clinical and medical services	Including private sector Standards of Construction	Patient experience Clinical processes Efficient workflow	Health Department Planning and Development Department Finance Department, Works & Services Department
2	Health Financing	Financing reforms General-tax financing, managed by an NHS or ministry of health (MOH) Payroll tax financed MHI (Mandatory Health Insurance) managed by a quasi-public entity	Strategic purchase program PPP models can be used to formalize such structures, whereby, the management and ownership is transferred to a private entity, while the government purchases the services Private sector-based health insurance financed by contributions to private voluntary insurers	Incentives should be provided to institute a third-party payment system. Centralized body with strong provincial linkages should be mandated to provide guidance, resources and frameworks to develop the healthcare insurance industry in Pakistan.	Finance Department Planning Commission Planning and Development Department Health Department , Private Sector and Health Insurance Providers
3	Capacity Enhancement	Building Workforce Capacities The national strategy should cover healthcare requirements for the population at large and cover both public and private service providers, medical colleges, skills and training institutes	Engagement of the private sector will be crucial since it is providing a platform for not just educating, but also training nursing and other allied health staff. Performance-based human resource management must also be instituted	Overall capacity enhancement will result in the development of not just the province but will also help other provinces as surplus capacity can then be shared. Capacity development institutions can be strengthened and utilized for generating revenue	Health department Finance Department Ministry of interprovincial coordination Planning Commission Planning and Development Department, SE&LD, STEVTA, Private Sector
4	Public Policy & Legislation	Investor friendly environment to attract local and	A comprehensive PPP framework must be built in consultation with all	Consistency and continuity in policies to ensure protection for the investor	Sindh Healthcare Commission, PPP Nodes in Health and Finance

		international investment focus on the systemic reforms to ensure equitable and efficient distribution of healthcare benefits	key stakeholders with a special focus on results-based contract management	foreign donation can also be incorporated build capabilities within existing human capital with a keen focus on efficiency in healthcare delivery	Departments, Department Private sector health care institutions Health Department
5	Governance and Leadership	Responsiveness to local requirements, and high engagement with local healthcare workers linkages with education, food security, agriculture and livestock, housing, sanitation, water, environment, IT, local government and social protection sectors will be important to support the health sector	Intersectoral action & inclusive involvement align with local leadership and infrastructure development	Implementation of new systems aligned with UHC (Universal Health Care) goals and objectives linkages with education, food security, agriculture and livestock, housing, sanitation, water, environment, IT, local government and social protection sectors will be important to support the health sector	National Parliament for consensus Health Departments (both federal and provincial) Inter provincial coordination ministry Local governments, cantonment boards
6	Digital Transformation	Easily implementable digital solutions need to be linked with service delivery functions to maximize efficiency of health spending, health promotion and disease prevention, disease surveillance and other related functions. Capacity development of healthcare professionals in making better use of big data and information systems should also be undertaken	Digital Technologies through which Spending on medical technology accounts for high investment and ought to be properly planned based on an optimal balance of cost-benefit to achieve the desired outcomes. National and regional registries can be linked with digital health system to support efficient and effective deployment of resources	End-to-end digital health systems. Public health purposes, such as public health surveillance for disease control, public safety emergencies and for providing information to policymakers. m-Health and e-Health initiatives for capacity development, knowledge transmission and improved service delivery	Ministry of Science and Information Technology (Federal) Finance Department IT Department Health Department Planning and Development Department, Punjab Information Technology Board, National Incubation Center, and other healthcare entrepreneurs for cost-effective digital solutions.

IX. APPENDIX 1

S.NO.	DISTRICT	POSITIVE
1	Karachi East	19782
2	Karachi South	16934
3	Karachi Central	11677
4	Karachi Malir	7251
5	Karachi West	6151
6	Karachi Korangi	5885
7	Hyderabad	3560
8	Sukkur	2997
9	Ghotki	2681
10	Khairpur	2114
11	Larkana	1762
12	Shaheed Benazirabad	1046
13	Shikarpur	982
14	Jamshoro	833
15	Sanghar	798
16	Mirpurkhas	735
17	Dadu	656
18	Jacobabad	616
19	Kashmore at Kandhkot	581
20	Kambar at Shahdadkot	555
21	Badin	496
22	Naushero Feroze	492
23	Thatta	345
24	Tando Allahyar	331
25	Tando Muhammad Khan	268
26	Umerkot	263
27	Matiari	256
28	Sujawal	255
29	Tharparkar	238

X. APPENDIX 2

List of hospitals, isolation and Corona Testing Centers in different cities of Sindh (as of 9 July 2020)
Source: (Health Department, Government of Sindh, 2020)

District	Name of Facility (Hospital)	Isolation Centre	Corona Testing Centre
Sukkur	GMMC Girls hostel new Sukkur	GMMMC Hosp. Sukkur – 170 beds	Ghulam Muhammad Mahar Medical College (GMMMC) Sukkur
	Taluka Hospital Rohri	IHS Hospital Labour Colony – 72 beds	
	Taluka Hospital Panoakil		
	Quarantine Center Labour Colony		
	HIS Hospital Labour Colony		
	Government Hospital Bagargi		
	GMMMC Hospital Sukkur		
Ghotki	DHQ Hospital Mirpur Mathelo	TTC Dahark – 170 beds	
	THQ Ubaoro	Educator School Ghotki – 50 beds	
	THQ Khangarh	Ghazali School Ghotki – 50 beds	
	THQ Dahariki	IBA Community School Ubauro – 80 beds	
	Home Isolated at Taluka Ubauro	GPS Khanpur Mahar – 60 beds	
	THQ Ghotki	DHQH Mirpur Mathelo – 50 beds	
	Gazali School Ghotki		
Khairpur	KMC Civil Hosp KHP	Foreign Facility Hostel S.A.L.U – 50 beds	GIMS
	Pir Syed Abdul Qadir Shah Jillani Institute of Medical Sciences	KMC CIVIL HOSPITAL – 80 beds	
		Pir Syed Abdul Qadir Shah Jeelani Medical Institute – 30 beds	
Larkana	Bibi Asifa Dental College Larkano	SMBHU Areja Quarantine Campus - 100 beds	Chanda Medical College Larkana
	THQ RatoDero	Asifa dental college hospital @ cmc H Larkano - 52 beds	
	THQ Dokri		
	THQ Bakrani		
	SMBBMU @ Areeja		
	RHC Naudero		
Kashmore-Kandhkot	Cadet College Karampur	Cadet College Karampur Isolation - 75 beds	
	THQ Kashmore		
	THQ Kandhkot		
	RHC Tangwani		
	RHC Karampur		
	RHC Ghouspur		
	MALC Centre Kandhkot		
	RHC Buxapur		

	Isolation centre Dera More (Proposed)			
Jacobabad	Gazali Public School Jacobabad	Ghazali Public School Jacobabad – 20 beds		
	Govt Boys Degree College	SABQA Public School Mubarkpur – 30 beds		
	Govt Girls Degree College	Govt. Degree College Boys – 50 beds		
	SABQA Institute Mubarakpur	DHQ Hosp. Jacobabad – 30 beds		
Shikarpur	Haji Lutiflah Bhayo Memorial Hospital	RBUT Hosp. Shikarpur – 6 beds		
	Public School	Lutifullah Bhayo Charitable Hosp. - 12 beds		
		Army Public School - 100 beds		
Kambar- Shahdadkot	DHQ KAMBER	DHQ KAMBER – 100 beds		
Shaheed Benazirabad	Isolation Ward Labour Colony	Labor Colony Nawabshah- 512 beds		
	PMCH Nawabshah			
	Quaid e Awam University Nawabshah Multipurpose hall	PMCH Nawabshah - 65 beds		
Naushero Feroze	Bahria Foundation College	Bahria Foundation College (Hostel) Padidan Road N-Feroze - 100 beds		
		Star Grammar Higher Secondary School Tharushah Road N-Feroze - 120 beds		
		Civil Hospital N-Feroze - 14 beds		
Sanghar	Civil Hospital Sanghar	shahdadpur Institute Of Medical Sciences Shahdadpur - 8 beds		
	Poly Technical College Sanghar	Poly Technical College Jhol Road - 100 beds		
Hyderabad	Isra Hospital	Isra University Hosp. Hala Naka Hyderabad – 204 beds	LUMHS Hyderabad	Hospital
	SGH Kohsar Latifabad	Kohsar Hosp. Latifabad – 90 beds		
	LUMHS Hyderabad	LUH, Hyderabad – 300 beds		
Dadu	Civil Hospital Dadu	C.H Dadu - 13 beds		
	Hepatitis Center Dadu	Hepatitis Centre Dadu – 50 beds		
	Taluka Hospital Mehar			
	Taluka Hospital KN shah			
	Taluka Hospital Johi			
	RHC Radhan Mehar RHC Digri Bala Jphi			
Jamshoro	Govt Hospital Noriabad	Syed Abdullah Shah Institute of Medical Science Sehwan 32 -	Syed Abdullah Shah Institute Sehwan (SASIMS)	
	ICD Kotri	ICD Kotri - 120 beds		
	SASIMS Sehwan	New Labour Flats SITE Area Kotri- 15 beds		
		DHQ Hospital Kotri – 60 beds		

Matari	Civil Hospital Matari	Sindh Small Industries Corporation Quarters, near Hala- 20 beds
	RHC Khyber	DHQ Matari – 10 beds
	RHC Odero Station	
	RHC Saeedabad	
	Sindh Small Industry Flats at Hala	
	THQ Hala	
Tando Allah Yar	DHQ Hospital TandoAllahyar	DHQ Hospital Bukera Road Tando Allahyar - 40 beds
Tando Muhammad Khan	DHQ Hospital TandoAllahyar	DHQ Hospital Bukera Road Tando Allahyar - 40 beds
Badin	Civil Hospital (Indus) Badi	Civil Hospital (Indus) Badin – 45 beds
	RHC Dei	
	THQ Shaheed Fazil Raho	
	THQ Matli	
	RHC Thari	
	RHC Tando Ghulam AI	
	RHC Pangrio	
	RHC Nindo	
	RHC Khoski	
	RHC Kadhan	
THQ Tando Bago		
Sujawal	Dewan Sugar Mill	Civil Hospital (Indus) Badin - 45 beds
	THQ Sujawal	
	RHC Daro	
	RHC Chohar Jamali	
Thatta	Cambridge School Makli	Cambridge School Makli (Managed by DHQ Makli) - 80 beds
Mirpurkhas	Civil Hospital Old	New DHQ Building - 50 beds
	THQ Digri	Muhammad Medical College Mirpurkhas – 20 beds
	THQ Kot Ghulam Mohammad	Shaheed Z.A Bhutto Sports Complex: Tando Adam – 46 beds
	RHC Tando Jan Mohammad	
	RHC Phulladiyoon	
	RHC Noukot	
	RHC Jhudo	
	PCB Ground	
	RHC Mirwah Gorchani	
	New DHQ CIVIL Hospital	
	Mohammad Medical College & Hospital	
	Tharparkar	Al Khidmat Hospital (Private)
THQ Nagarparkar	Mono Technical College - 50 beds	
THQ Kheme jo par	Al Khadimat Hospital – 30 beds	
THQ Diplo	Al Mahdi Hospital – 20 beds	
THQ Chachro	Thar Foundation Hospital – 15 beds	
Thar Foundation Hospital (Pvt)		

	SAZDA Banglow (Pvt)			
	RHC Islamkot			
	Mono Technical College			
	Love & Trust Hospital (Pvt)			
	BHU Kaloi			
	BHU Chelhar			
	Al Mahdi Hospital (Pvt)			
Karachi	50 Bedded Hospital Mansoor Nagar Orangi Town	Field Isolation Center @ Expo – 590 beds	Advanced Centre	Diagnostic
	RHC Baldia	DUHS OJHA CAMPUS – 40 beds	AKU Hospital Karachi	
	RHC Keemari	KMC 50 Bedded Hospital Pathan Colony (purposed)	Children Hospital	
	RHC Mangopir	Sindh Govt. Lyari General Hosp. – 98 beds	Children Hospital	
	RHC Shershah	Dr. Ruth K.M Pfau Civil Hosp. Karachi – 68 beds	Civil Hospital Karachi	
	UHC 15 Orangi Town	JPMC, Karachi – 100 beds	Dr. Essa Laboratory & Diagnostic Centre	
	Sindh Govt Hospital, New Karachi	Lakhani Hosp. – 50 beds	Hashmanis Lab (Numaish)	
	Sindh Govt Hospital, Liaquatabad	SGH, Liaquatabad – 20 beds	INDUS Hospital Karachi	
	Karachi Institute of Heart Diseases	Gadap city Hospital – 118 beds	JPMC	
	Abbasi Shaheed Hospital	Dumba Goth Hospital – 70 beds	Liaquat National Hospital & Medical College	
	Hussain lakhani hospital	SGH Saudabad malir – 12 beds	OJHA Dow Campus Karachi	
	Aga Khan University Hospital	Sindh govt. hospital 5 No. Korangi – 22 beds	PNS Shifa	
	DUHS OJHA	25 Beded Hospital korangi 1 1/2	SIUT	
	Expo Center		South City Hospital	
	Gadap City		Zia Ud Din Hospital	
	Civil Hospital Karachi		Zia Ud Din Hospital (Clifton)	
	SIUT		Zia Ud Din Hospital (Clifton)	
	Lyari General Hospital			
	JPMC			
	Quarantine Labour Flats			
	Gadap City Isolation			
	Dumba Goath Isolation			
	Indus Hospital			
	Sindh Govt Hosp Shah Faisal Colony			
	Sindh Govt Hospital Korangi no 1 ½			
	Sindh Govt Hospital Malir Shed			
	UHC Babar Market Landhi			

XI. APPENDIX 3 (Pictorial Overview of GoS Initiatives for COVID-19)



CM Sindh (Murad Ali Shah), chairing a meeting of the provincial task force on COVID-19.

Visited Indus Health Network Lab where sample of majority of passengers from Taftan are being tested.



Chief Minister Sindh - Syed Murad Ali Shah inaugurating 140 bedded High Dependency Unit (HDU) at the Expo Centre, Karachi.



Media Briefing on Corona virus with experts Dr. Faisal Mahmood Head of Infectious disease A.K.U.H. and Dr. Bari of Indus Hospital - here Dr. Bari is apprising about the facts of the current situation and how best to manage it.



CM Sindh - Syed Murad Ali Shah Inaugurating a newly developed 54 Bedded Infectious Disease Facility for COVID-19 affectees located at NIPA, Karachi.



XII. REFERENCES

- Adam Fusheini, J. E. (2016). Achieving universal health coverage in South Africa through a district health system approach: conflicting ideologies of health care provision. *BMC Health Services Research*, 1-11.
- BBC News, Tokyo. (2020, July 4). *Coronavirus: Japan's mysteriously low virus death rate*. Retrieved from [www.bbc.com: https://www.bbc.com/news/world-asia-53188847?at_custom1=%5Bpost+type%5D&at_custom3=BBC+News&at_custom4=4B49ADDCC-BDE1-11EA-8B85-D87C96E8478F&at_medium=custom7&at_campaign=64&at_custom2=facebook_page](https://www.bbc.com/news/world-asia-53188847?at_custom1=%5Bpost+type%5D&at_custom3=BBC+News&at_custom4=4B49ADDCC-BDE1-11EA-8B85-D87C96E8478F&at_medium=custom7&at_campaign=64&at_custom2=facebook_page)
- Chaudhry, M. A., & Khan, A. (2020). *Shaping 21st Century Public Health in Pakistan: An Actionable Agenda for Achieving Universal Health Coverage*. Islamabad: Tabadlab Private Limited.
- China Daily . (2020, January 9). *Transparency can check speed of Virus: China Daily Editorial* . Retrieved from [https://global.chinadaily.com.cn/ https://global.chinadaily.com.cn/a/202001/09/WS5e171ee7a310cf3e355838f5.html](https://global.chinadaily.com.cn/https://global.chinadaily.com.cn/a/202001/09/WS5e171ee7a310cf3e355838f5.html)
- China Daily . (2020, March 12). *WHO declares coronavirus a pandemic*. Retrieved from [https://www.chinadaily.com.cn: https://www.chinadaily.com.cn/a/202003/12/WS5e691ebba31012821727e4ac.html](https://www.chinadaily.com.cn/https://www.chinadaily.com.cn/a/202003/12/WS5e691ebba31012821727e4ac.html)
- Collins, C. D. (1988). Local government and urban protest in Colombia. *Public Admin. Dev.*, 421- 436.
- CoronaTracker. (2020, July 9). <https://www.coronatracker.com/country/pakistan/>. Retrieved from [www.coronatracker.com: https://www.coronatracker.com/country/pakistan/](https://www.coronatracker.com/country/pakistan/)
- DAWN. (2020, February 28). *No new cases of coronavirus detected in Sindh today: health ministry*. Retrieved from www.dawn.com: <https://www.dawn.com/news/1536974>
- DAWN. (2020, February 27). *Pakistan confirms first two cases of coronavirus, govt says 'no need to panic'*. Retrieved from www.dawn.com: <https://www.dawn.com/news/1536792>
- DW. (2020, June 8). *Coronavirus: 5 things New Zealand got right*. Retrieved from www.dw.com: <https://www.dw.com/en/jacinda-ardern-leadership-in-coronavirus-response/a-53733397>
- Ferdinando Giugliano. (2020, April 10). *Greece shows how to handle the crisis*. Retrieved from www.bloomberg.com: <https://www.bloomberg.com/opinion/articles/2020-04-10/greece-handled-coronavirus-crisis-better-than-italy-and-spain>
- Finance Department, Government of Sindh. (2020, June 30). https://fd.sindh.gov.pk/elfinder/connector?_token=&cmd=file&target=fls2_Q0VGLONFR19JbmNvbWVCcmllZi5wZGY. Retrieved from www.fd.sindh.gov.pk: https://fd.sindh.gov.pk/elfinder/connector?_token=&cmd=file&target=fls2_Q0VGLONFR19JbmNvbWVCcmllZi5wZGY
- Geo. (2020, July 4). *100 days of Pakistan's COVID-19 fight*. Retrieved from www.geo.tv: <https://www.geo.tv/latest/296323-pakistans-fight-against-covid-19-ncoc-wall-highlights-nations-resolve>
- Government of Pakistan. (2020, July 9). <http://covid.gov.pk/stats/pakistan>. Retrieved from www.covid.gov.pk: <http://covid.gov.pk/stats/pakistan>

- Government of Pakistan. (2020, July 10). *Punjab COVID-19 Statistics*. Retrieved from www.covid19.gov.pk: <https://newslab.tribune.com.pk/auto-draft/>
- Government of Sindh, Health Department . (2020, July 17). *Introduction to Sindh Health Department* . Retrieved from www.sindhhealth.gov.pk: <https://www.sindhhealth.gov.pk/Introduction>
- Government of Sindh, Health Department . (2020, July 16). *Districtwise Statistics COVID-19*. Retrieved from www.sindhhealth.gov.pk: <https://www.sindhhealth.gov.pk/Districtwise-Statistics-COVID-19>
- Hassan, A., Mehmood, K., & Bukhsh, H. A. (2017). Healthcare System of Pakistan. *International Journal of Advanced Research and Publications*, 170- 173.
- Health Department, Government of New Zealand. (2020, July 10). *COVID-19: Epidemic Notice and orders*. Retrieved from www.health.gov.nz: <https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-current-situation/covid-19-epidemic-notice-and-orders>
- Health Department, Government of Sindh. (2020). *Daily Situation Report*. Health Department . Karachi: Government of Sindh.
- Health Department, Government of Sindh. (2020, February 27). https://services.sindhhealth.gov.pk/healthRest/upload/documents/notification/notification_E_A_HD_10_35_2020__158279973229.pdf. Retrieved from www.sindhhealth.gov.pk: https://services.sindhhealth.gov.pk/healthRest/upload/documents/notification/notification_E_A_HD_10_35_2020__158279973229.pdf
- Health Department, Government of Sindh. (2020, July 9). www.sindhhealth.gov.pk. Retrieved from www.sindhhealth.gov.pk: www.sindhhealth.gov.pk
- Imran Khan. (2020, July 27). *Imran Khan Official - Facebook Page*. Retrieved from www.facebook.com: <https://www.facebook.com/ImranKhanOfficial/photos/pcb.5009822152393498/5009812149061165/?type=3&theater>
- Indus Hospital. (2020, February 27). *The Indus Hospital and Sindh Government Gearing up to Fight Corona Virus*. Retrieved from www.indushospital.org.pk: <https://indushospital.org.pk/news/the-indus-hospital-and-sindh-government-gearing-up-to-fight-corona-virus/>
- Institute of Health Policy and Development Studies. (2005). *Migration of health workers: Country case study Philippines*. Geneva: International Labor Office.
- Khan, I. (2020, July 27). *Imran Khan Official*. Retrieved from www.facebook.com: <https://www.facebook.com/ImranKhanOfficial/photos/pcb.5009822152393498/5009812179061162/?type=3&theater>
- Khan, I. (2020, July 27). *Imran Khan Official* . Retrieved from www.facebook.com: <https://www.facebook.com/ImranKhanOfficial/photos/pcb.5009822152393498/5009812149061165/?type=3&theater>
- Khan, I. (2020, July 27). *Imran Khan Official - Facebook Page*. Retrieved from www.facebook.com: <https://www.facebook.com/ImranKhanOfficial/photos/pcb.5009822152393498/5009812179061162/?type=3&theater>
- Khan, S. A. (2019). Situation Analysis of Health Care System of Pakistan: Post 18 Amendments. *Health Care: Current Reviews*, 7(3), 1-9.

- Ministry of Health. (2009). *National Health Policy* . Islamabad : Ministry of Health, Government of Pakistan.
- Ministry of Health and Welfare, Government of Korea. (2020, February 25). *COVID-19 Response: Korean Government's Response System* . Retrieved from <http://ncov.mohw.go.kr>: <http://ncov.mohw.go.kr/en/baroView.do?brdId=11&brdGubun=111>
- Ministry of Planning, Development and Special Initiative. (2020). *COVID-19 response Annual Plan 2020-21*. Islamabad: Government of Pakistan, Planning Commission.
- National Command and Operations Centre. (2020, July 23). *National Command and Operations Centre - Situation Report Part - I* . Retrieved from www.ncoc.gov.pk: [https://ncoc.gov.pk/Sitrep/Jul/113.%20%20Sitrep%20-%2023%20Jul%20\(Updated\).pdf](https://ncoc.gov.pk/Sitrep/Jul/113.%20%20Sitrep%20-%2023%20Jul%20(Updated).pdf)
- NCOC. (2020, July 9). *National Command and Operational Centre*. Retrieved from www.ncoc.gov.pk: www.ncoc.gov.pk
- Nishtar, S. (2010). *Choked Pipes: Reforming Pakistan's Mixed Health System*. Karachi : Oxford University Press.
- Reuters. (2020, February 26). *Greece confirms first coronavirus case, a woman back from Milan* . Retrieved from www.reuters.com: <https://www.reuters.com/article/us-china-health-greece-idUSKCN20K11A>
- Shah, M. A. (2020). *Budget Speech 2020-21*. Karachi: Government of Sindh.
- The Aga Khan University . (2020, April 17). *Sindh Government and AKU Collaborate to boost COVID-19 critical care*. Retrieved from www.aku.edu: https://www.aku.edu/news/Pages/News_Details.aspx?nid=NEWS-002140
- The News. (2020, June 16). *Major cities of Pakistan undergo COVID-19 'smart lockdown'*. Retrieved from www.thenews.com.pk: <https://www.thenews.com.pk/latest/673062-smart-lockdown-imposed-in-certain-cities-as-covid-19-cases-jump-past-148000>
- Tribune. (2020, June 8). *Coronavirus cases to peak in Pakistan by end of July or August: PM Imran*. Retrieved from www.tribune.com: <https://tribune.com.pk/story/2238292/1-lockdown-not-solution-covid-19-pandemic-pm-imran>
- Tribune. (2020, February 26). *Sindh closes educational institutions on Thursday, Friday amid fear of coronavirus*. Retrieved from tribune.com.pk: <https://tribune.com.pk/story/2164945/1-sindh-closes-educational-institutions-thursday-friday-amid-fear-coronavirus>
- Tribune. (2020, March 22). *Sindh imposes 'complete ban on people's movement' with few exceptions*. Retrieved from www.tribune.com.pk: <https://tribune.com.pk/story/2181472/1>
- Tribune. (2020, February 3). *Sindh sets up rapid response team to contain novel coronavirus*. Retrieved from www.tribune.com.pk: <https://tribune.com.pk/story/2149509/1-sindh-sets-rapid-response-team-contain-novel-coronavirus>
- Tribune. (2020, July 17). *Tracking the deadly outbreak: The Express Tribune brings you the latest news and analyses along with local and global trends to keep you updated & informed*. Retrieved from www.newslab.tribune.com.pk: <https://newslab.tribune.com.pk/auto-draft/>
- World Bank. (2012). *Health equity and financial protection report - Pakistan*. Washington D.C. : World Bank.

World Health Organization. (2016). *Pakistan's health system*. Retrieved from www.who.int: <https://www.who.int/countries/pak/en/>

World Health Organization. (2020). *Situation Report 1 - Novel Coronavirus*. Geneva: World Health Organization. Retrieved from https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4

Worldometer. (2020, July 9). <https://www.worldometers.info/coronavirus/>. Retrieved from www.worldometer.com: <https://www.worldometers.info/coronavirus/>



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