REVIEW ARTICLE

RESPONDING TO THE COVID 19 PANDEMIC IN A RESOURCE CONSTRAINED COUNTRY: THE CASE OF PAKISTAN

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Background: Pakistan, like the rest of the world has not been spared by COVID-19, with the cases escalating nationwide. Being a developing country, Pakistan has had meagre resources and weak health systems to tackle the menace. We analysed the national response of Pakistan to the pandemic by critically analysing the interventions taken at community, health systems and multi-sectoral level and identifying the response gaps. The fragile health system of Pakistan performed fairly well according to its ability - the bed capacity was expanded, health professionals' capacity building strategies were adopted, telemedicine was put into practice, indigenous production of required personal protective equipment started, testing capacity was increased, and attempts were made to improve the surveillance mechanisms. However, the strategies adopted at the community level proved in-adequate. The severity of the disease was not communicated clearly to the public, religious leaders were not effectively on board, social distancing measures were not strictly followed specially during religious festivities, contact tracing was not extensively carried out specially in the rural areas - overall awareness of the community to COVID-19 remained low. The educational institutions were closed in time but the intermittent lockdown procedures and easing of transport restrictions led to community spread of the virus. Overall, Pakistan's performance has been acceptable, but community engagement and participation need to be improved.

Keywords: Pakistan; Covid-19; Health Systems

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INTRODUCTION

Novel corona virus (COVID-19), one of the worst pandemics in the history of mankind touched the mark of affecting more than 167 million people spread across 210 countries and territories, on 28th July, 2020; eight months after the appearance of the first case in the Wuhan city of China (worldwide confirmed cases and deaths: 16,779,951 and 660,318 respectively, as of 28th July, 2020).[1] With epicentres shifting from China to Italy, Iran, Spain, France and Germany; United States now bears 37% of the total worldwide cases (4,461,071 as of 28th July, 2020).[1] Only a handful of countries including China and South Korea have been able to parry the thrusts of COVID-19 by widespread application of rigorous public health measures. Lock down measures, social distancing, isolation and quarantine, extensive contact tracing, mobilization of health workforce and enhanced bed capacity remain some of the strategies to contain and combat the virus. Nonetheless, the number of new cases and death toll continue to escalate in the world, with no definitive treatment, chemoprophylaxis or vaccine yet evidenced.

Pakistan, the fifth most populous country; shares geographical border with two COVID-19 epicentres, China and Iran to the north and west respectively.[2] The index case appeared on 25th Feb, 2020; since then, the outbreak showed a rising trend, spreading to all four provinces and territories, affecting males and females of all age groups.[1] Pakistan has had 275,225 confirmed cases to date with a recovery and case fatality rate of 98% and 2% respectively (as of 28th July, 2020).[3]

Pakistan is a developing country with fragile health systems and less than 1% of GDP spent on health.[4,5] Myriad political and economic measures, guidelines and strategies have been implemented in Pakistan to combat COVID-19 situation. We sought to analyse (a) the steps and interventions taken by the government and health sector amidst meagre resources to determine their value and effectiveness; (b) simultaneously highlighting the gaps and challenges in the national response, (c) and exploring other viable options that can be put into practice to pave the way for future.

Trends of the epidemic in Pakistan since Feb 26

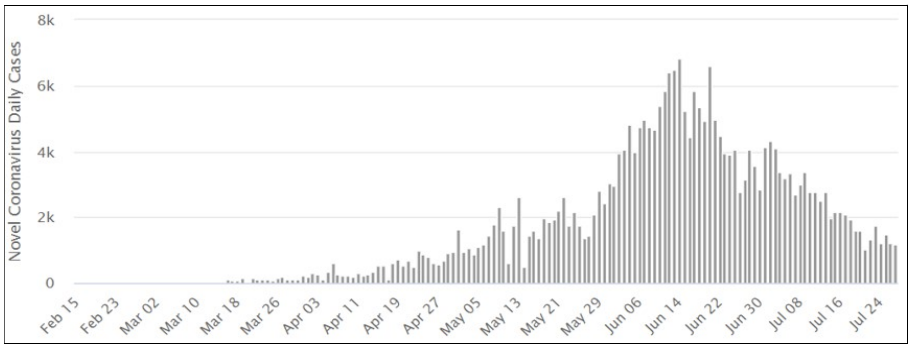


Figure 1: Daily new cases of Covid-19 in Pakistan

The first two cases of COVID-19 in Pakistan were reported on 26th Feb, 2020; both of whom had recently returned from Iran. The initial cases had a travel history outside Pakistan; the first case of local disease transmission was diagnosed 17 days after the index case, where after the daily toll of new cases up surged (Figure-1). First COVID related mortality was verified 25 days post index case. The first thousand cases of COVID-19 across Pakistan occurred in 28 days, next in 7 and 5 and 2 days. Currently Pakistan harbors 1,244 cases of COVID-19 per million population. There was an initial preponderance of cases in Karachi and twin cities but gradually the virus involved all regions of the country, the province of Punjab demonstrating the highest numbers followed by Sindh and KPK respectively.

Framework of analysis & methods

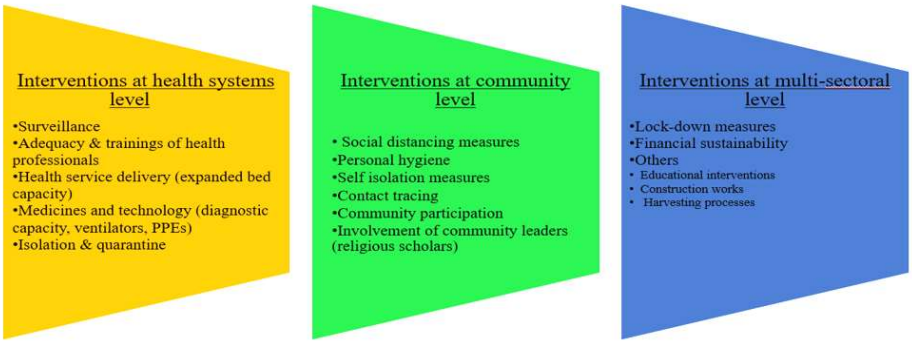


Figure-2: Interventions adopted in the national response of Pakistan against COVID-19

A framework was created to assess the national response of Pakistan to Covid-19 (Figure-2). The framework assesses the national and provincial response at three levels viz; interventions at health systems, community and multi-sectoral levels (Figure-2). The health service delivery, adequacy and training of health workforce, surveillance, expanded bed capacity, availability and distribution of medicines, technology, PPEs testing kits and laboratories were analysed at the health systems level. Interventions at the community level included measures of social distancing, personal hygiene, contact tracing, community participation and involvement of community leaders. Varied interventions at multi-sectoral level were assessed such as lock-down implementation and stringency, financial sustainability measures, educational procedures, construction dealings, harvesting processes etc.

Data and information pertaining to each level were retrieved from the databases of the government of Pakistan, National Institute of Health, National Command and Operation Centre, daily reports of World Health Organization and national and provincial daily newspapers.

Chronology of measures introduced by the federal and provincial governments

Health systems level

Surveillance

Health surveillance has traditionally been weak in Pakistan with District Health Information System (DHIS) reporting only from the secondary and tertiary tiers of the public sector of selected districts of the country. Covid-19 data flows from district to provincial to federal level and is presented on a dashboard by National Institute of Health, Islamabad.[6] Polio surveillance mechanism has also been utilized to gather

information. Daily situation reports are also prepared by WHO. Surveillance of Covid-19 at international airports was started early in the course. Recently, terror surveillance technology of Inter-Services Intelligence (ISI) has started to assist in tracking Covid-19 patients by utilizing geo-fencing and telco-tracking mechanisms.[7]

Adequacy & trainings of health professionals

Pakistan suffers from a dearth of health professionals with a density of 12/ 10,000 population.[8] The doctor-population and nurse-patient ratio of Pakistan are 1:963 and 1:50 respectively.[9] New hiring were carried out in the province of Sindh to cater for the patient load of Covid-19.[10] The National Institute of Health and Health Services Academy initiated a series of training of health professionals across all provinces after the Covid-19 outbreak (more than 10,000 health professionals).[11] The Aga Khan University (AKU) is currently carrying out virtual acute critical care patient management training to doctors, nurses and paramedical staff to build the capacity of the public sector.[12] Telemedicine services, utilizing mobile calls, Skype, WhatsApp etc. have been widely rolled out by public (Punjab Telemedicine center) and private sectors (Shifa Hospital, AKU) to provide health consultations to suspected and confirmed cases of Covid-19. These services have mobilized local and overseas Pakistanis to provide their health expertise.[13]

Health service delivery

The hospital bed capacity was increased in the major cities, early in the course of the outbreak to cater for the impending burden of Covid-19 patients. The Karachi and Lahore expo-centers were converted to 1200 and 900 bed isolation centers respectively; a new 250 bedded hospital was constructed in Islamabad.[14–16] Pakistan Railways also converted 220 coaches with a total capacity of 2,000 hospital beds for Covid-19 patients.[17] The government booked 1,795 three- and four-star hotels in which 40,000 patients can be accommodated if required.[18] A large number of field hospitals have also been established throughout Punjab and Sindh.[14] Currently, Pakistan has 19,670 beds in the ICUs of public hospitals.

Medicines and technology

The testing capacity of Covid-19 has increased tremendously from 500 to 83,300 daily tests; however, only 40% is being utilized.[19] Indigenously produced Covid-19 testing kit has now been approved (accuracy: 90%) and is expected to decrease the testing cost by one-third.[20]

Pakistan imported personal protective equipment (PPEs) initially but is now self-sufficient in the production of sanitizers, face shields, goggles, and protective gowns. There is a total of 4,200 ventilators in Pakistan; 1,350 of which are being used for Covid-19 patients.[21] Recently, local production of ventilators has commenced and 2,000 ventilators are expected to be produced in near future.[22] Different medical regimes are being followed for the management of Covid-19 according to the changing guidelines. Currently, oxygen support, dexamethasone and convalescent plasma are being used and there is no reported shortage of these drugs.[23–25]

Isolation & quarantine

The guidelines for home and community quarantine have been prepared by NIH. Screening followed by isolation and quarantine commenced at the international airports early in the course of the outbreak. There are 23,557 beds for quarantine in all the provinces and the government is now stressing on home isolation for all mild to moderate cases.

Interventions at community level

Social distancing measures

Applying social distancing measures has been problematic for Pakistan, owning to low literacy rate, and religious fervour for Ramadan and congregational prayer among the population. Six feet apart circles have been drawn in front of banks, shops for waiting customers in queue to practice social distancing. Recently, Pakistani authorities backed by security forces shut down more than 3,000 shops and markets across the country in a series of raids for violating social distancing regulations.[26] One of the mandates of the "tiger force" is to ensure social distancing in public places. SOPs to practice social distancing have been formulated for industries, transport, mosques, commercial markets etc. but implementation remains poor.

Personal hygiene

Social media has been active to promote adoption of personal hygiene measures such as wearing face masks, hand washing, using hand sanitizers etc. Non-compliance of the public led to making wearing masks a mandatory requirement in crowded public places, mosques, shopping malls, bazaars and public transport by the government on May 30, 2020.[27] NGOs (e.g., the Asia Foundation) have been assisting the government in distribution of critical products: soap, disinfectants, face masks to severely affected communities.[28]

Self- isolation measures

Self-isolation and quarantine centers were constructed at the Taftan border for the returning pilgrims from Iran followed by other isolation facilities created in Sukker. The provinces of KPK and Punjab converted educational and Hajj building complexes into quarantine centers. Citizens were enforced to stay in self-quarantine and isolation to contain the spread of the virus. Later, recommendations for establishment of quarantine centers, home-isolation and strict self-isolation of the patients were put forward by the federal government. Screening centers were established in conjunction with

the civil aviation authority for passengers returning through international flights.

Contact tracing

Contact tracing of Covid-19 patients was commenced by the National Institute of Health, Islamabad (NIH) in coordination with Field Epidemiology and Laboratory Training Program; in the capital territory followed by the provinces. In late May, the Inter-Service Intelligence (ISI) in Pakistan deployed secret surveillance technology to track Covid-19 patients and the people they came in contact with.[29] In June 2020 the government launched Covid-19 contact tracing app; "Covid-19 Gov PK". However, with limited testing capabilities, testing has been low in Pakistan with 8,635 tests per million population.[30]

Involvement of community leaders (religious scholars)

During the early spread of Covid-19 in Pakistan, the religious scholars were taken on board to aid community awareness. The *Ulemas* from all sections of society responded by closure of mosques and madrassas and banning of congregational prayer. However, in the holy month of Ramadan (May), the mosques were re-opened and SOPs not seen to be followed that resulted in exponential growth of cases in the succeeding months. Currently, less emphasis is seen in engaging the religious leaders to create awareness among the masses for Covid-19. This might be a contributory factor to decreased community participation and adherence to SOPS in shopping malls, markets, salons, transport etc.

Community participation

The people were complaint with government restrictions in the beginning, but gradually lost conformity in following guidelines and SOPs. The authorities were not able to create the required community awareness, as fallacies and misconceptions overpowered education.

The common myth amongst people of Pakistan rejects the actual disease presence of Covid-19 and regards the scenario as a conspiracy of the west.

Interventions at multi-sectoral level

Lock-down procedures

Lockdown procedures and social isolation have proved to be successful public health measures to curb Covid-19. Early in the course of the outbreak, flight operations between China and Pakistan were stranded (30 Jan, 2020) and land border sealed.[31] The government was less pro-active to seal border with Iran, the new emerging epicenter for Covid-19. Quarantine center was established in the far-flung town of Taftan, but ineffective screening and isolation measures led to Pakistani religious pilgrims returning from Iran as the doorway for Covid-19 in Pakistan. Earlier quarantine at the border was followed by pilgrims being re-admitted to a newly established isolation facility in Sukker before returning home. Pakistan closed the border with Iran on 23 Feb 2020

Decision of intermittent lock-down across all provinces was taken on 24 Mar 2020; to halt the rapid community spread of the virus and avoid catastrophic impoverishing of poor at the same time. All educational institutions, shopping malls, entertainment places, industries, transport services and offices were shut down and work from home policy implemented. In late May 2020, all international flights were suspended; however, the lock-down was eased out on the occasion of "Eid". Shopping malls and markets were opened, and transport restored leading to a drastic increase in the daily cases. Later, "smart lock down" was enforced in the major cities of Pakistan.

Financial Sustainability

Pakistan is a developing country with 29% of the population (55 million) living below the poverty line. The lock down procedures offered a major challenge to sustain the estimated 3 million population working as daily wagers. The recently launched Pakistan Poverty Alleviation Program: Ehsaas, distributed cash payments of worth PKR 12,000 to 12 million families after quick verification of financial status. Additional 6 million people were provided one-time cash assistance of PKR 12,000. Pakistan-Baitul-maal assisted Covid-19 hit families through E wallet system. The World Bank and Asian Development Bank provided loans of $1billion & $1.25 billion respectively. The Government of Pakistan established the "Prime Minister's Covid-19 Pandemic Relief Fund - 2020" to contribute to the Government's efforts. Social mobilization was deployed, and NGOs were involved in diverting funds to COVID-19 relief efforts.

Others

Pakistan decided to resort to a balanced approach between harrowing need of shutting all business spaces and prerequisites of achieving financial sustainability, along with active reassessments of ongoing situation. Construction and agriculture sectors were identified safe for early reopening with SOPs during the first week of April 2020. All schools and educational institutions were closed and board exams cancelled (May 06). Malls, salons and gyms, and mosques were reopened after Supreme Court orders with SOPs implemented. SOPs were formulated for opening of shopping malls, food courts, wedding halls, gatherings, educational institutions and so on.

Challenges and gaps in the response: a critical review

Interventions at the health systems level:

It has almost been a decade when Pakistan under-went devolution, and the health system still suffers from lack of clarity of role, responsibility and accountability at the provincial and federal levels. A continuous friction between the federal and provincial governments was witnessed in designing and implementing strategies to combat Covid-19. Pakistan already suffered from a

weak surveillance system that was attempted to be strengthened by utilizing the polio surveillance mechanism. However, the information flowing from the district to provincial to federal level entertained urban bias and the cases from rural areas were under-represented.

Pakistan had shortage of health infrastructure, which was partially overcome by enhancing the diagnostic and bed capacity. However, the required bed capacity was not epidemiologically calculated on Covid-19 projections; nonetheless, the health facilities are now overwhelmed with patients. Pakistan has been effective in the manufacturing of PPEs as it is now self-sufficient. Similarly, there has been no reported shortage of medicines for the care and management of Covid-19 patients. Indigenous manufacturing of ventilators is also in process, but cost-effectiveness analysis needs to be done to better understand/ plan their worth as the proportion of complications by Covid-29 is slowly reducing.

Pakistan has a huge shortage of health work force in terms of number, distribution, and quality of training. New recruitments were minimal. The non-clinical and non-working health staff (specifically doctors) could have been mobilized as exigency of service, as in UK, but no such strategies were outlined. Various trainings to health professionals were offered but remained scarce in comparison to the spread of the outbreak. With increasing numbers of internet connections (35% of population) and mobile users (75% of population), telemedicine played an important role in care and management of Covid-19. Nevertheless, Pakistan is among one of the lowest spenders on health (less than 1% GDP), possesses poor governance and weak implementation at the district level, and frail emergency preparedness to disasters and epidemics; we could not expect wonders from a fragile health system.

Community level:

The gravity of Covid-19 was not communicated to population since the beginning. The foremost messages conveyed from the highest level of political government included "*Ghabrana nhi hai!*" (Don't worry about the situation) and "*Corona se darna nhi hai larna hai"* (Don't get scared of corona, fight it!). The communication led to people taking the situation lightly and continuing the routine activities without taking proper precautions. Religious leaders were not on board to the extent of becoming a resource of risk communication to the population. Many shared conflicting stances with the government regarding congregational prayer and religious sermons; refused to comply with the lock-down procedures and a large portion of population seemed greatly influenced by their opinions. Lack of coordination between policy makers and religious leader was apparent when despite opposition of the government, a massive religious congregation was held in March, in Raiwand. The gathering entertained 250,000 members from all across Pakistan and over 40 countries and served as the water shed moment in community spread of Covid-19 in Pakistan.

Contact tracing was rigorously started but could not produce the desired results especially in rural areas. The contact tracing also proved to be a failure. WHO's guideline on trace, test and treat was therefore not followed in full spirit.

Multisectoral:

The federal and provincial governments were pro-active in decision making and implementing lock-down measures earlier during Covid-19. The Pak-China border was closed well in time; however, there was a delay in sealing the Pak-Iran border. The pilgrims returning from Iran travelling in packed buses were "quarantined" together in reportedly squalid conditions in Taftan. Testing was minimal and symptomatic cases were not isolated. Even before erecting a quarantine center at Pak-Iran border, hundreds and thousands were already dispersed to their towns/ villages and could not be traced leading to a massive spread of the virus. However, the isolation center in Sukker was timely erected and provided a second chance of isolation to the returning pilgrims from Iran to Sindh province. Though the management of the facility was not exemplary, yet it provided some opportunity of considerable time lapse from exposure to resolution of symptoms.

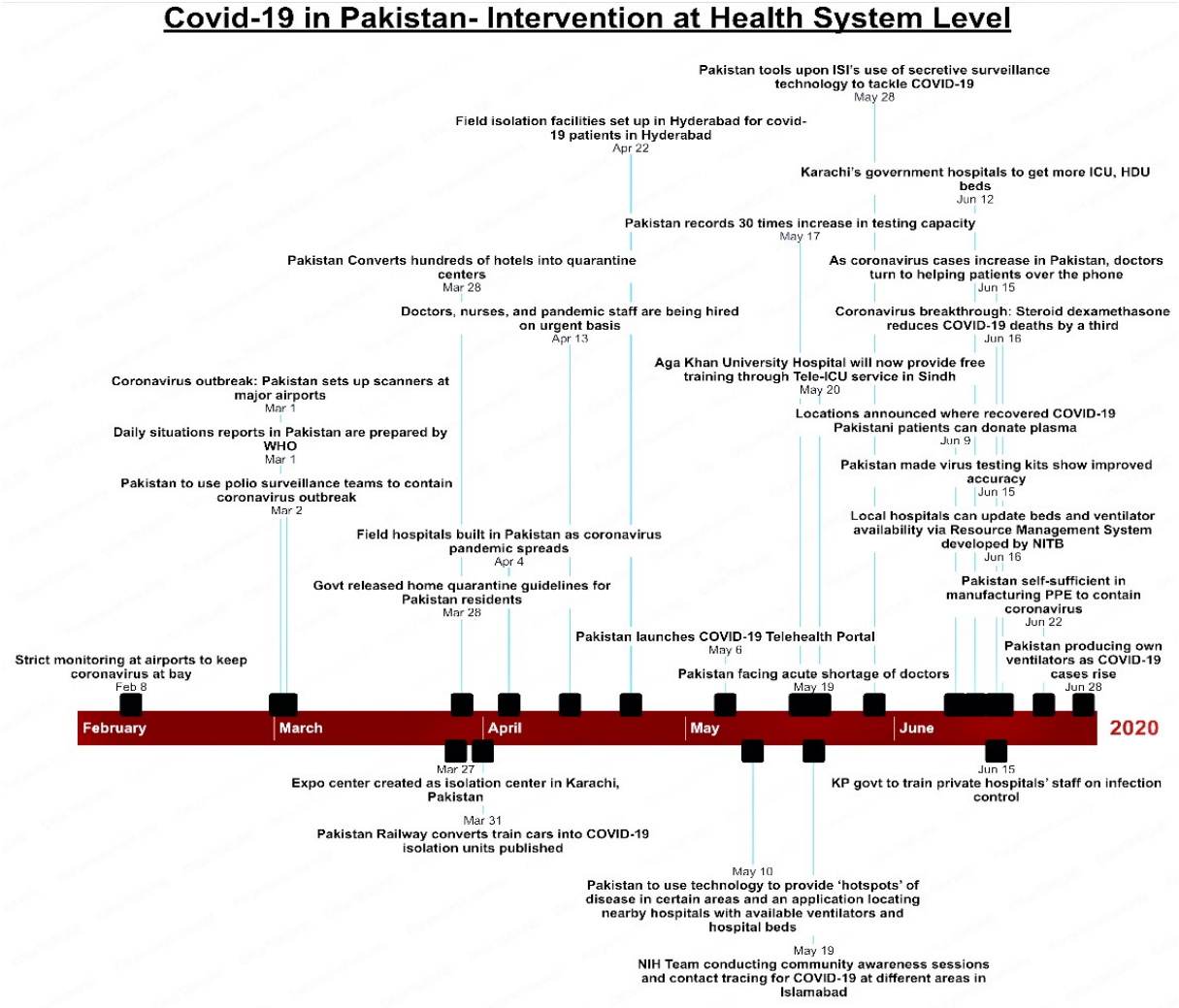
Despite barriers in stringent implementation of lock-down measures, Pakistan initially did reasonable, till the lifting of lock-down measures for the Eid festival (end of May 2020). Businesses, transport, shopping malls and markets were restored open; that aided the stammering economy but allowed Covid-19 to strengthen its grip in the major cities.

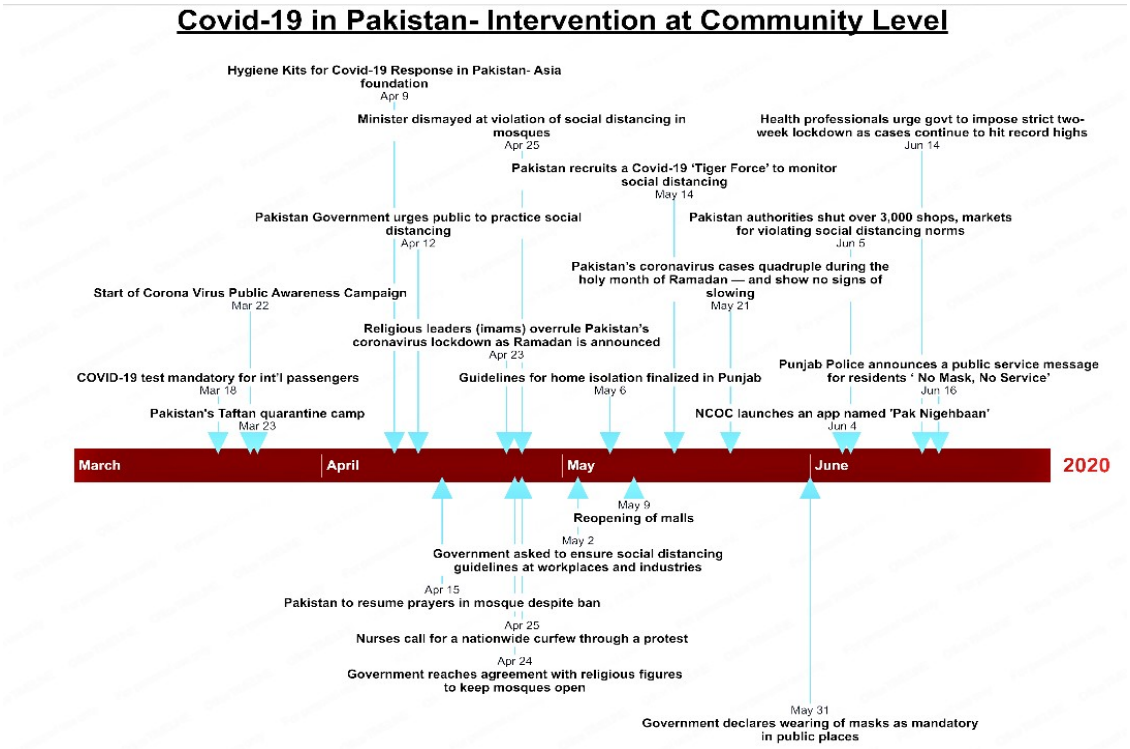
As far as lock down measures are concerned, Pakistan's approach was very realistic and balanced right from the beginning. Pakistan was among those few states where government machinery studied measures taken by the developed countries and used their own innovative approach as well. Financial assistance catering needs of poorest segments was a wise decision where country's capital of philanthropic activities was relied, organized and deployed successfully. Better trained sectors like armed forces and intelligence agencies were well deployed in relief and pandemic control efforts from building of isolation centers till contact tracing and industries were directed to produce protective equipment for emerging needs of population. Overall government coordinated well with multiple sectors to control pandemic situation, however stammering economic conditions and loose implementation at certain points resulted in disease outcomes which could have been otherwise avoided.

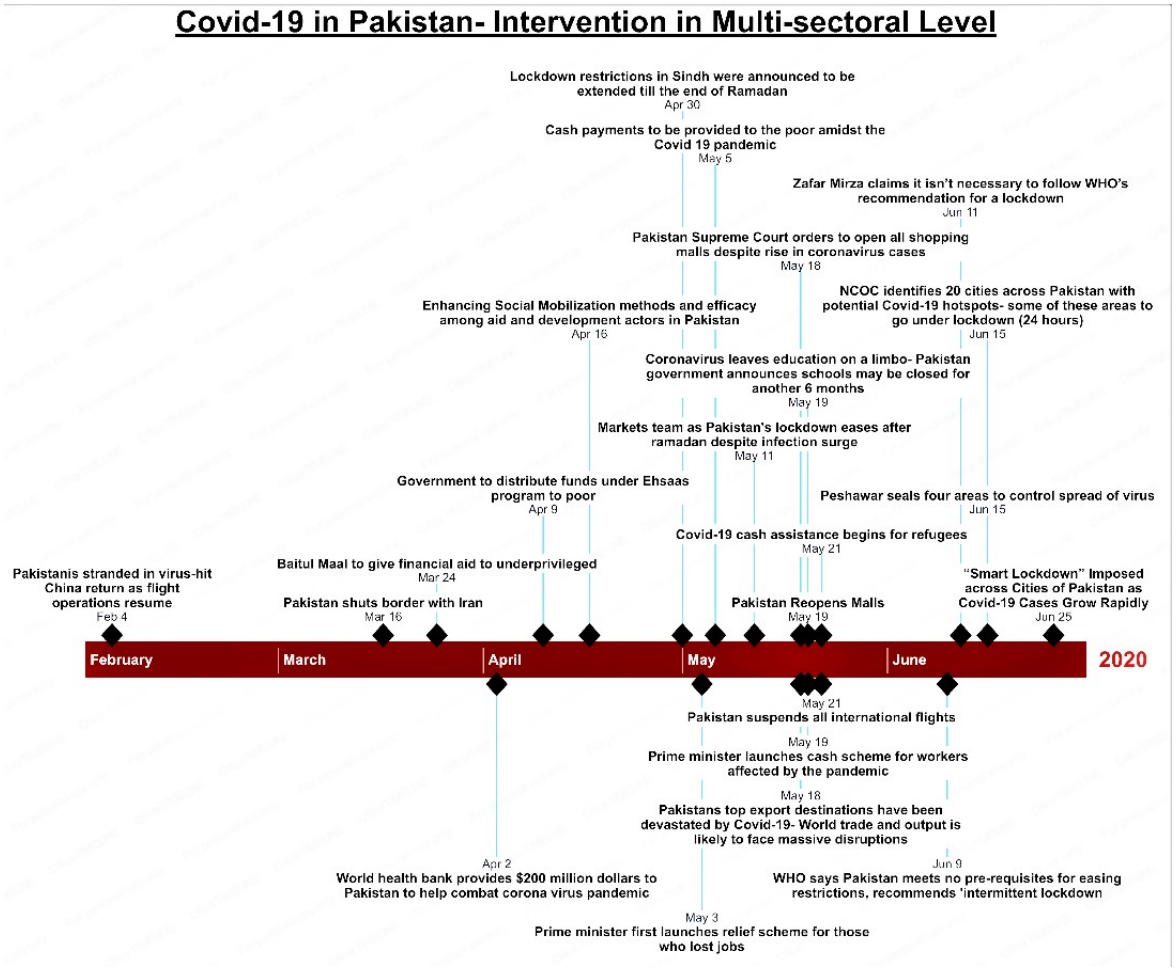
Way forward

- First and foremost, the policy makers need to work on improving community engagement and participation in combatting COVID-19. The religious leaders need to be on board to counter the myths and misconceptions of people about the virus. Diverse tools of communication viz, folk plays, television, social media, seminars, campaigns etc. need to be utilized to penetrate effectively in the deeper pockets of the community.
- Testing and contact tracing needs to be enhanced. Mobile apps showing geographical mapping of COVID 19 patients could be utilized to maintain contact tracing records of COVID-19.
- Recent evidence suggests that children could transmit Covid-19 more efficiently than adults; thus, re-opening of educational institutions (by the end of August, 2020) is expected to cause a surge in the number of cases. Online modes of education need to be looked into to halt the spread.
- The transport system has been re-vitalized in the country with SOPs. However, the implementation of SOPs remains poor and strict measures need to be taken to ensure compliance.
- WHO has suggested the strategy of smart lockdown for Pakistan (intermittent lock down for two weeks followed by lifting for two weeks); that has been implemented in the hot spots of major cities. However, the strategy needs to be executed nationwide.
- Telemedicine has been in place to provide health consults for COVID-19 patients but needs to be ramped up. The people also need to be educated to stay at home for mild symptoms and prioritize virtual consults.
- The health systems and hospitals' preparedness, mitigation and response to disasters needs to be strengthened for future outbreaks and pandemics.

Timelines




Covid-19 in Pakistan- Intervention at Community Level
Hygiene Kits for Covid-19 Response in Pakistan- Asia foundation
Apr 9
Minister dismayed at violation of social distancing in mosques
Apr 25
Health professionals urge govt to impose strict two-week lockdown as cases continue to hit record highs
Jun 14
Pakistan recruits a Covid-19 'Tiger Force' to monitor social distancing
May 14
Pakistan Government urges public to practice social distancing
Apr 12
Pakistan authorities shut over 3,000 shops, markets for violating social distancing norms
Jun 5
Pakistan's coronavirus cases quadruple during the holy month of Ramadan — and show no signs of slowing
May 21
Start of Corona Virus Public Awareness Campaign
Mar 22
Religious leaders (imams) overrule Pakistan's coronavirus lockdown as Ramadan is announced
Apr 23
COVID-19 test mandatory for int'l passengers
Mar 18
Guidelines for home isolation finalized in Punjab
May 6
Punjab Police announces a public service message for residents ' No Mask, No Service'
Jun 16
Pakistan's Taftan quarantine camp
Mar 23
NCOC launches an app named 'Pak Nigehbaan'
Jun 4
March
April
May
June
2020
May 9
Reopening of malls
May 2
Government asked to ensure social distancing guidelines at workplaces and industries
Apr 15
Pakistan to resume prayers in mosque despite ban
Apr 25
Nurses call for a nationwide curfew through a protest
Apr 24
Government reaches agreement with religious figures to keep mosques open
May 31
Government declares wearing of masks as mandatory in public places


Covid-19 in Pakistan- Intervention in Multi-sectoral Level
Lockdown restrictions in Sindh were announced to be extended till the end of Ramadan
Apr 30
Cash payments to be provided to the poor amidst the Covid 19 pandemic
May 5
Zafar Mirza claims it isn't necessary to follow WHO's recommendation for a lockdown
Jun 11
Pakistan Supreme Court orders to open all shopping malls despite rise in coronavirus cases
May 18
Enhancing Social Mobilization methods and efficacy among aid and development actors in Pakistan
Apr 16
NCOC identifies 20 cities across Pakistan with potential Covid-19 hotspots- some of these areas to go under lockdown (24 hours)
Jun 15
Coronavirus leaves education on a limbo- Pakistan government announces schools may be closed for another 6 months
May 19
Markets team as Pakistan's lockdown eases after ramadan despite infection surge
May 11
Government to distribute funds under Ehsaas program to poor
Apr 9
Peshawar seals four areas to control spread of virus
Jun 15
Covid-19 cash assistance begins for refugees
May 21
Pakistanis stranded in virus-hit China return as flight operations resume
Feb 4
Baitul Maal to give financial aid to underprivileged
Mar 24
Pakistan shuts border with Iran
Mar 16
Pakistan Reopens Malls
May 19
"Smart Lockdown" Imposed across Cities of Pakistan as Covid-19 Cases Grow Rapidly
Jun 25
February
March
April
May
June
2020
May 21
Pakistan suspends all international flights
May 19
Prime minister launches cash scheme for workers affected by the pandemic
May 18
Pakistans top export destinations have been devastated by Covid-19- World trade and output is likely to face massive disruptions
Apr 2
World health bank provides $200 million dollars to Pakistan to help combat corona virus pandemic
Jun 9
WHO says Pakistan meets no pre-requisites for easing restrictions, recommends 'intermittent lockdown
May 3
Prime minister first launches relief scheme for those who lost jobs

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