

PANDEMIC AND BIOLOGICAL THREATS: WAY FORWARD FOR PAKISTAN

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Abstract

Biological hazards pose non-traditional threat to human security, primarily due to their devastating nature and ever-changing character. Coronavirus (COVID-19) is the black swan of 21st century which has played havoc with states and public across the globe without sparing rich and poor. Pakistan is also confronting human security challenges with dire consequences on national security. It includes uneven distribution of health care infrastructure, lack of adequately trained paramedical staff, non-availability of critical health care equipment and absence of research and development in disease control and prevention. Although, Pakistan managed to cope up with the massive health emergency through quick health care optimisation and build up measures under the framework of National Command and Operational Centre (NCOC), yet the experience has raised questions on the viability of existing pandemic response framework in absence of such central body. This paper is an endeavour to carryout objective analysis of response framework of contemporary world in limiting COVID-19 pandemic to draw relevant inferences to refine the response framework against future challenges.

Keywords: COVID-19, Spanish Flue, Human Security, National Security, NCOC.

Introduction

Biological hazard poses threat to health of living organisms and takes form of a virus, pathogens, or bioactive substances. It occurs due to natural phenomenon or self-generated and turns up into epidemic or pandemic with the spread of disease over multiple countries. There are numerous instances in the past, when artificially created toxins such as anthrax and botulinum were deliberately used by countries and terrorist organizations to inflict casualties and spread terror.¹ Their frequency and lethality can be judged from the fact that approximately ten major epidemics/pandemic have occurred in last hundred years, which have resulted in accumulated deaths of over ninety million people across the globe. According to the World Bank, out of nearly 50 million worldwide deaths in 1990, 34.4% were due to infectious disease, while wars took only 0.64%.² Moreover, Spanish Flu of 1918 killed more Americans in one year than in all 20th century US conflicts combined. Clearly, disease

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presents a far greater threat to the physical security of human than war ever has. Spanish Flu and COVID-19 possess broad similarities in terms of cause and effect. Therefore, both pandemics are analysed to draw relevant inferences.

Spanish Flu

The influenza pandemic of 1918-1919 was the most severe health disaster of 20th century. Since the influenza outbreak was first reported during First World War (WW-I) on eastern front in Spain, therefore it was referred as 'Spanish flu'. Reportedly, flu originated due to poor sanitary conditions of troops during WW-I. Despite limited interconnectivity, virus mostly spread through frequent movement of army troops. Due to extreme censorship and limited information, false assumptions led to stigmatisation of various nationalities and races like French flu, German flu etc.³ Influenza pandemic caused great sufferings in combination with conflicts of WW-I and led to enormous socio-economic challenges for the affected countries.⁴ It mostly targeted people with high immunity system and affected the people between 18 to 40 years.⁵ The deadly impact of virus on young people also led to famine due to ploughing shortages in rural areas in worst hit countries.⁶ However, the overall effects of Spanish Flu were localised and short-lived due to factors like limited economic interdependence and lack of globalisation etc.

In absence of any medical solution, pursuance of Non-Pharmaceutical Interventions (NPIs) remained the hall mark of government's response strategies against Spanish Flu. The term coined for containment of virus was 'crowd control', which was manifested through ban on mass gatherings and closure of public places, schools, churches, postal and train services.⁷ Instead of social distancing and lockdowns, more emphasis was laid on pursuance of personal protective and hygiene measures including use of face masks, disinfectants etc. Due to existence of limited health care infrastructure vis-à-vis increased quantum of patients, isolation of infected was encouraged at their homes. It is pertinent to highlight that influenza virus remained a continuous source of concern for world until development of a permanent cure in shape of influenza vaccine in 1933. Due to complex intricacies of health-related issues, health ministries in France and Great Britain were created after this pandemic. Some of the key inferences derived from analysis of Spanish Flu include:

- Fear and politicisation of crisis can quickly generate stigmatization of others in a wrong, unfair, and unproductive way.⁸
- The prominent causes of the pandemics were poor sanitary, hygiene conditions and zoonotic and vector borne viruses.

- Key features of past pandemic were slow spread due to limited connectivity, high mortality rate and protracted periods of disease.
- Enforcement of timely and aggressive NPIs by the governments resulted in breaking up of transmission chain.
- Health security figured out as an important national security imperative.⁹

Coronavirus

On 30 December 2019, Chinese doctor Li Wenliang warned his former medical classmates that a new coronavirus infection has been confirmed in Wuhan.¹⁰ On 31 December, Chinese authorities officially informed World Health Organisation's (WHO) China office of pneumonia cases in Wuhan city with unknown cause.¹¹ On 7 January 2020, China identified new coronavirus as the cause of the outbreak and reported first death on 9 January. On 13 January, Thailand reported first imported case of Coronavirus in a woman from Wuhan and by 5 Feb, virus got transmitted in Europe, North America, and Australia beside Asia.¹² The major reason of disease spread was its ability to transmit through human-to-human contacts via respiratory aerosols and droplets. The Coronavirus spread strikingly fast in comparison to SARS and MERS-Coronavirus. While SARS took 4 x months in infecting 1000 people, MERS took 2.5 years, whereas COVID-19 took 48 x days only.¹³ The important factor in silent propagation of disease was interconnectivity due to vast rail network and frequency of domestic flights from Wuhan and international flights from Shanghai to rest of the world. As per sources, approximately 5 million people potentially exposed to the virus had already left Wuhan before placed under quarantine with effect from 23 January 2020.¹⁴

COVID-19 made a profound impact on all aspects of human societal aspects including social, psychological, economic, health, education, religious etc. With the onset of pandemic, restrictions were imposed on public movement and closed business, which further devastated the global economic outlook. As per World Bank (WB) forecast, a 5.2 % contraction in global GDP was expected by end of 2020.¹⁵ The current recession is termed as the worst recession after the 'Great Depression' of 1930s and could take 2 years to return to pre-pandemic levels.¹⁶ As per UN report, up to 265 million people could face starvation by the end of 2020.¹⁷ COVID-19 caused unprecedented socio-economic impact on the world, necessitating integrated response.

Table-1: Comparison of COVID-19 with Spanish Flu

Detail	Spanish Flu	COVID-19
Source of Transmission	Human to human	Human to human
Scale of Disease Spread	Global	Global
Medium of Propagation	Respiratory Aerosols	Respiratory Aerosols
Duration of Pandemic	2 years	1 x year & ongoing
Target	High immune system	Low immune system
Mortality Rate	10%	4%
Transmission Rate (Ro)	1.8	2.5
Effects	Socio-economic	Socio-economic

Source: Author's own compilation.

Tackling COVID-19: Global Practices

There was a relatively delayed response of WHO towards containment of disease at international level, which was evident from the fact that COVID-19 was declared pandemic on 11 March 2020, while it had already spread globally by end January 2020.¹⁸ On one hand, the UN remained ineffective in building global solidarity, on the other hand, global role of the US is also reasonably diminishing due to its 'inward looking' approach. On the contrary, China used this opportunity to project its soft power through extensive use of medical diplomacy. To draw best global practices, response strategies of few countries is discussed.

a) Vietnam

With the reporting of coronavirus in China, Vietnam quickly completed its health risk assessment, issued guidance on prevention and detection by 21 January 2020 and prepared national response plan to be implemented by national steering committee by end January 2020. The first case of COVID-19 was detected on 23 January 2020. Vietnam resorted to strict preventive measures including airport screening, physical distancing, travel ban on foreign visitors, 14x days quarantining of international travellers, school closure, wearing of masks at public places even before WHO's recommendations, shut down of non-essential services, workplaces, residential building, and strict control on movement.¹⁹ Another feature was use of aggressive and cost-effective measures. In comparison to mass testing, Vietnam focused on high risk and suspected cases. It conducted over one million tests for 1000x cases at the rate of 1000x tests per confirm case. Thus, resorted to extensive

contact tracing, isolation and quarantining up to third contact. Approximately 450,000 people were quarantined, where treatment and care were provided free of cost. Early containment and use of public and military facilities proved cost effective as budgetary cost on fighting pandemic was only 0.2% of GDP. Risk communication was immediate and transparent, wherein, symptom details, protective measures and testing sites were communicated through mass media. Well-coordinated multimedia approach helped in winning public trust and adherence of protection and containment measures by people. The success of Vietnam is attributable to strict containment strategies of the government, extensive contact tracing, isolation, and standard operating procedures (SOPs) compliance by the people at large.

b) Italy

Two northern regions of the country i.e., Lombardy and Veneto took two different strategies for its containment.²⁰ The strategy adopted by Veneto was based on aggressive tracing, testing, quarantining of both symptomatic and asymptomatic, collection of samples from their homes, strict monitoring of pharmacists and grocery store cashiers etc. Contrarily, Lombardy was less aggressive on all fronts i.e., testing, proactive tracing, home care and monitoring workers. Consequent to adoption of two different strategies, Lombardy with 10 million population suffered 103000 cases and 16896 deaths, whereas Veneto having 5 million population suffered 24529 cases and 2138 deaths. Hence, aggressive as well as proactive testing of Veneto was key towards lesser casualties and COVID-19 cases.

c) China, India, and USA

USA and India resorted to decentralized strategies contrary to China's centralized control and unified strategy. Interventions like lockdown were delayed in USA with only half states closing in phase one. In India, after reporting of first case on 30 January 2020, only dozen states activated provisions of 1897 Epidemic Control Act and closed schools and businesses to control the spread of virus. National lockdown of 3x weeks was enforced on 24 March 2020, however it could not be physically implemented in true letter and spirit due to movement of thousands of daily wagers from urban centres to rural areas.²¹ Situation was further aggravated due to limited testing capacity of 4100 tests vis-a-vis 29000 average test per million of global till June 2020.²²

SOPs compliance was strictly enforced in China in-comparison to USA and India. Another important factor was pursuance of aggressive testing regime. USA did 19.1 tests per case, India 12.4, which was less than aggressive testing standards desired by WHO. Due to difference in approach and containment strategies, China was able

to contain the virus, however USA and India struggled due to greater positive percentage ratios.

The comparative analysis of these countries leads to following conclusions:

- Aggressive containment complimented by strict enforcement of SOPs worked for China.
- Delayed course correction by resorting to aggressive measures worked for Italy.
- Denial and delayed approach of USA and mishmash of strategies led to virus spread in USA.
- India's inability to implement strict lockdown at the beginning, mixture of strategies and inadequate testing, tracing, and quarantining led to spread and spike.

Pakistan and COVID-19

Pakistan experienced COVID-19 outbreak in relatively later timeframe thus could witness general behaviour of virus, response strategies of other countries and best practices recommended by WHO. After initial outbreak of COVID-19, government functionaries in Pakistan were activated. Ministry of Health coordinated treatment of Pakistani nationals with China and established passenger screening posts at four major airports. On 13 March 2020, National Security Committee constituted National Coordination Committee (NCC) chaired by Special Advisor to the Prime Minister (SAPM) for Health to formulate and implement a comprehensive strategy to prevent transmission of virus and mitigate its consequences. NCC included all relevant federal ministers, provincial chief ministers and provincial health departments and designated National Disaster Management Agency (NDMA) as lead operational agency for procurement. However, owing to lukewarm response by provinces, inter-ministerial coordination, limited capacity of federal health ministry and exponential disease spread across globe, National Command and Control Centre (NCOC) was established on 27 March 2020 to synergise and articulate a national response.

During the initial stages, COVID-19 mitigation policy faced challenges of conflicting global practices, lesser information about virus behaviour, lack of reliable data and limited capacity of national health system. Therefore, policy guidelines issued by NCOC to provinces and ministries for formulation of national strategy/response essentially covered four domains to include disease prevention/containment, health care optimisation and build up, community engagement for enhancing disease awareness and managing socio-economic fallouts.

The disease prevention and containment were manifested through improvement in disease management by enhancing testing capacity, preventing spread, trace and quarantine, smart lockdown, focus on community mobilisation for SOPs compliance. It also included screening of international travellers at all points of entry to prevent disease spread. To optimise health care, NDMA was tasked to procure critical care/protective equipment and improvement of resource management. Federal government added 2,690 oxygenated beds including oxygen manufacturing to national health system.²³ Ministry of Health engaged provinces and health community for training and motivation of health care workers. Availability of essential medicines and vaccine including local production was also ensured through Drug Regulatory Authority Pakistan (DRAP). Indigenous development of ventilators and testing kits was encouraged by Ministry of Science & Technology through Pakistan Engineering Council. Moreover, National Information & Technical Board and Digital Pakistan launched Tele-health, Yaran-e-Watan and Resource Management System. Enhancement of public awareness regarding disease prevention/containment measures and risk communication was aimed to reduce panic, manage public expectations, and prevent fake information from proliferating. In addition, health safety SOPs and sets of guidelines for social distancing were issued to prevent virus spread. On the socio-economic front, government announced relief packages to support economy and embarked upon one of the biggest cash disbursement programmes. Government also encouraged a gradual re-opening of economy for low-risk sectors and passed special anti-hoarding and anti-smuggling ordinances to ensure food and economic security.

Challenges to National Response

Countries with developed health system and stable economies had the flexibility to impose a protracted lockdown, however, Pakistan faced certain challenges that had a significant impact on national response due to fragile economy and under resourced health system.

a) National Health Response Capacity

Pakistan's national health system, after 18th amendment, remained under-resourced due to spending of 2.9% against global average of 10%. Hence it lacked mechanism and capacity to handle a pandemic of such magnitude. In addition, federal government also did not have any legislative provision for invoking health emergency, therefore creation of NCOC became a compulsion for coordinated implementation of national response.

b) Role of Provincial Governments

Despite capacity issues and initial divergence on implementation, provinces made significant contributions to enable Provincial Disaster Management Authority (PDMAs), health departments and district administrations in pursuing aggressive testing, tracing, and quarantining measures to curtail the virus spread. During the response formulation and implementation, NCOC facilitated vertical collaboration and coordination between federal government, NDMA, LEAs and federating units.

c) Complicated Federal Structures

Proactive governance structures are critical for quick and efficient response during such crisis, whereas in Pakistan's case, existing government processes follow long procedures, therefore NDMA Act 2010 had to be utilised for COVID-19 related emergent procurements and enrolments.

d) Border Management

On 23 March 2020, Pakistan decided to start screening, however owing to limited capacity, its implementation was delayed leading to unchecked entry of international travellers thus adding to disease spread. However, due to lack of coordination with Iranian government, *Zaireen* traveling back from Iran could not be screened at Taftaan for COVID-19 infection.

e) Insufficient Disease Diagnostic Facilities

Initially, only 4 public sector laboratories with capacity of 400 tests per day were available. Isolation facilities were inadequate and lacked human resource, medical supplies and required structures to ensure implementation of health protocols. To enhance capacity for disease mapping, private sector was enabled through provision of testing machines and kits thus facilitating testing at subsidised rates.

f) Non-Availability of Reliable Disease Data

Pakistan did not have any mechanism for reliable disease forecasting therefore had to rely on foreign prediction models which forecasted exponential disease spread in Pakistan adding to panic amongst public especially health care workers.

g) Management of High-Risk Events

Government imposed lockdown with effect from 24 March 2020 with varying degree to contain disease spread, however, initial implementation of general lockdown across the country had socio-economic implications. Later, as per vision of

PM, smart lockdowns were enforced thus facilitating poor by opening economic activity. During initial stages, challenge of divergent political opinion had negative impact on implementation of lockdown.

h) Risk Communication and Community Engagement

Community dynamics, religious beliefs and economic fragilities seriously hampered strategy formulated to deal COVID-19. Due to inadequate awareness campaign and circulation of fake news doubting the very existence of COVID-19, health SOPs were disregarded by larger part of society, leading to disease surge after Eid-ul-Fitr.

i) Disease Surveillance System

Pakistan lacked disease surveillance system that could assist in disease surveillance and monitoring. Integrated Disease Information Management System (IDIMS) provided by WHO for polio was used as basic platform for disease mapping through data gathered from laboratories and identification of hotspots to implement lockdowns.

j) Information Technology (IT)

IT could play a pivotal role in providing data analytics and real time disease visibility for planning, coordinating, and directing national effort. However, due to absence of such platform, initially disease mapping and resource management of critical care equipment was seriously affected.

k) Impact on Essential Immunisation and Routine Healthcare

All outpatient departments (OPDs) providing routine hospital services and essential immunisation including polio stopped functioning due to fear of disease spread which presented a challenge for general healthcare.

l) Role of Pharmaceutical Industry

Pakistan has approximately 770 medicine companies, registered with DRAP.²⁴ The share of local and multinational companies in medicine production is 70:30. The country imports 95% of its raw material from Shanghai and Beijing while the rest comes from Japan, Spain, and Italy. Under biohazard threats and pandemic situation, role of pharmaceutical industry becomes more pronounced in maintaining stock level of general medicines due to probable disruption in supply-chain system and conduct of research and development in vaccine development in-collaboration with public sector.

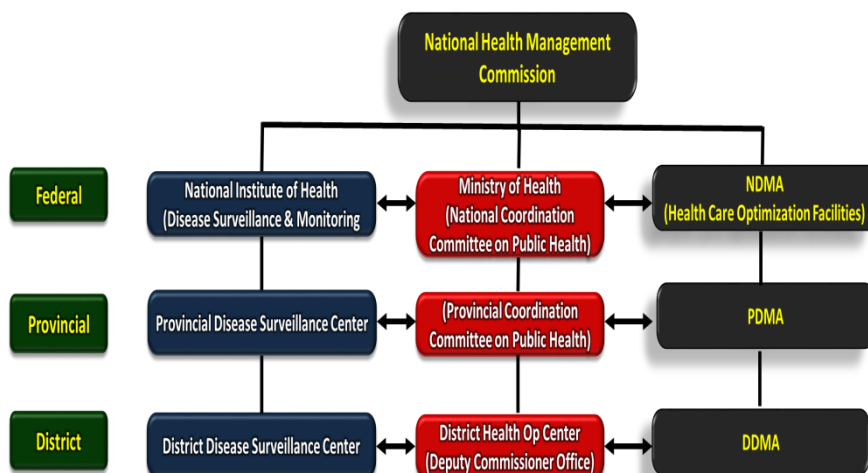
Findings

After having discussed COVID-19 response of contemporary world and challenges confronted by Pakistan in tackling the pandemic, key conclusions drawn from domestic environment include:

- Pandemic surveillance and research and development emerge as critical requirement in correct assessment of causes, patterns, and preventive measures.
- Under-resourced public and private health care infrastructure warrants immediate capacity building initiatives to sustain overwhelming patients during health emergencies.
- IT can act as a force multiplier in real time data acquisition and mapping of disease for making correct assessments and directing appropriate response.
- Political structure of Pakistan after 18th amendment poses challenges for developing consensus among federating units on policy issues.
- There is a need for formulation of laws and acts for triggering & implementing public health emergency discourse.
- Disruption in global supply chain has hampered imports of raw material for pharmaceutical industries, hence there is a need to explore alternate markets within the region.
- NCOC effectively managed the pandemic in Pakistan but there is a need to formulate a permanent institution on lines of disaster management system.

Way Forward

To effectively manage public health emergencies, this study proposes formulation of a permanent 'National Health Management Commission' (NHMC) through legislation with federal, provincial and district tiers. The suggested structure of NHMC is shown in the following diagram (Figure 1).

Figure-1: National Health Management Commission

Source: Author's own compilation.

For actualisation of national health emergency framework, NHMC may be mandated for risk communication, health care supplies/facilities, human resource, research and development and enforcement.

a) Risk Communication

To mitigate risk, there is a need for optimisation of electronic, print, and social media for perception management, review of educational curriculum to refine health and hygiene practices.

b) Health Care Supplies & Facilities

There is a need for establishment of strategic medical stockpiles to ensure continuous availability of critical health care equipment, and incentivising industry for its enhanced local production. Create capacity to shift to alternatives, self-efficiency in critical health care equipment and establishment of isolation hospitals.

c) Human Resource

Human resource development of doctors, para medical staff, and district administration involved in public health along with capacity building of Army, LEAs, border control and screening mechanisms is need of hour.

d) Research & Development

To enhance capacity of National Institute of Health (NIH) by collaboration of public and private biomedical research and their interface with international research institutes for disease surveillance and monitoring. Synergise the potential of local pharmaceutical industry in research and development specially biohazard surveillance and monitoring, bioequivalence, and vaccine development through public private partnerships.

e) Enforcement

There is a need for enforcement of public health emergency imperatives, through preparation of national pandemic preparedness and response plan, its implementation, coordination, and monitoring through suggested framework.

Conclusion

Pandemic preparedness and response framework did not exist at the national level for generating appropriate response against biohazard threats. Existing disaster response framework is not configured to respond to biohazard threats due to constitutional limitations, structural inadequacies, absence of mandate and intricacies to deal public health issues. NCOC bridged this gap and played a pivotal role in harnessing available resources and mitigating pandemic effects through systematic and apt handling of evolved challenges. Owing to interim nature of NCOC and its likely status post COVID-19, there is a need to articulate national response framework against biohazard threats for ensuring human security.

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