COVID-19

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Pursuit of Ideal Strategy to Manage Pandemic: A Comparative Study of COVID 19 for USA, Italy, Spain, China, and Pakistan

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Dedicated to Holy Prophet Muhammad (PBUH)-Rahmat-ul-Alameen

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1. INTRODUCTION

From the early times to the present, it is evident that epidemics have influenced human antiquity in numerous ways; categorised as demographic, social, economic, and biological. In the past some of major epidemics remained Plague, Cholera, Influenza, Spanish Flue, and Smallpox. Cholera epidemics emerged in early 19th century in India; Black Death with its impact on medieval Europe; virgin soil epidemics that ravaged native populations all over the world. Similarly, the effect of endemic infection on native people have a well-developed history. Authors such as Laurie (2000) expounded on the relation of poverty and politics that subsidises to renaissance of infectious diseases, and proposed a stimulating evaluation of the failure of public health in the former Soviet Union and situation of public health in the United States at the end of the Reagan Era. Author also predicts the threat of bio terrorism in future. Additionally, Diamond (1997), Elbe (2011) contend that geographical benefit steered to the expansion of agriculture and the taming of animals, which in turn preceded to settlement and crowd in diseases those in the New World never encountered before. Stuckler et al. (2013) criticises the measures to eradicate poverty soon after the emergence of financial crisis 2008 and claim that "in countries where austerity is dominant, we're experiencing enormous and untested experiment on human health and left to count the dead". Gutierrez et al. (2000) clarifies that due to global economy of scale, political processes with the advent of decrease in transportation costs there is increase in volume of trade. Thus, this phenomenon lead to epidemiological transition (from transmissible to non-communicable diseases as causes of illness and death) known as globalisation of disease. So the pandemic has dimensions such as poverty exacerbating it or being discriminated from, pandemics arising from human taking over the nature and nature retaliating, pandemics arising because of lack of adequate public health facilities and finally pandemics making its way owing to the extreme globalisation. Pandemic has been a periodical feature in the history of human being, with varying catchment areas and intensity of devastation having diversified reasons. The probability of occurrence of pandemic may be increased in future due to increasing scientific experimentation, technological advancements, increased mobility, exposure to other planets, conflict of human beings and other natural beings. Hays's (2009) demonstrated the relation between poverty, power, and disease. Furthermore, discrepancies in wealth around the world are frequently at the core of epidemics.

The pandemic such as COVID 19 has spread over the Globe, it started its formidable appearance from China. Different school of thoughts of its origin having interpretation of an unwanted outcome of the scientific research, political economy, natural disorder, slippage of natural organ, preplanned initiative of a vested interest

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group, etc. Around millions of people have been physically and clinically affected from the COVID 19 (Mosher, 2020). It has directly and indirectly affected people; economically, psychologically, morally, socially, and mentally almost 7.79 Billion population of the world. The pandemic showed its devastation in Wuhan Province of China in the Period of December 2019 to May 2020 through infecting 83,991 people and 4,637 3 dead. Initially it went down to other parts of the world, European countries, Italy, Spain, UK, France, Germany, and so on. In Asia it also travelled to Iran, Middle Eastern Countries, Pakistan, India, Singapore, and other countries (Spencer, 2020). It also proliferated over the continents of North American, South American and Australia. In USA at the moment reportedly around 1,309,541 number of persons have been infected, around 78794 have been died. Italy and Spain have number of infected people 218,268 and 223, 578 and deaths 30,395 and 26,478 , respectively. Pakistan has infected persons totalling more than 29,465 and deaths closing 600. Worldometer, (2020, May 7)). PIDE COVID-19 Bulletin No 1 identified that due to the recession and policy of lock down there will be increase in poverty levels and it may raise to 33.7 percent in case of a low impact scenario. Further PIDE COVID-19 Bulletin No. 4 and 13 showed that the vulnerable unemployment will increase up to 12 million in present circumstances nationally and Punjab province would be the most severely affected with. Owing just to the trade disruptions PIDE COVID-19 Bulletin 11 projected that the GDP in fourth quarter of FY20 will decline by 4.64 percent and Bulletin 20 identified that remittances will decline from 9 percent to 14 percent in the FY20.

The pandemic showed huge collateral damage, human lives losses, social, economic, psychological, trade, physical losses etc. It exposed the weakness of the existing world community, leadership models, social contracts, preventive and curative health system. It also made realisation of review of existing social capital-based interactions and framing future roles of regional countries etc. For understanding of the implication of COVID 19, pandemic preparedness, strengths, and weaknesses of the existing system, it's challenges, a comparative study of US, European Union, Italy, Spain, China, and Pakistan is made. It will help to assess sustainability of existing system of governance, leadership model, capabilities of human beings at state level and international level, gaps in the models, strategy for future pandemic preventive system, and curative system development. In this regards the paper is divided into, understanding stages of pandemic, implications of pandemic, comparison of pandemic management models, strategy for pandemic management.

2. STAGES OF PANDEMIC (COVID 19)

The pandemic expanded in a nonlinear manner; randomly sporadic fashion, had exponential growth over the globe. The pandemic has four stages; (1) Origination stage, pandemic originate in a particular part of the world then may spread in any or a particular part of the world or grow at its own place of origination. (2) Asymptomatic period of non-significant proliferation during dormant and gestation period around two to four weeks. The mode of its spread remained 3 dimensional; contagious, droplets and micros, may be transferred through physical contact of persons from a career, irrespective of its infectious status or not to others. It may be transferred through droplet infection from air or any other medium, the existing virus after inhaling get transferred into the body. It

may be in the form of microorganism spread in the air during speaking, discussion and other means, are inhaled, carried by any person, which may later on enter into the body, specially mouth, throat and then lungs causing further infection, sickness in the human body. A number of persons despite having number of virus do not show symptoms, due to higher immunity level, then over the time the virus is eliminated from the body of immune persons. In the persons with low level of immunity it takes around 2 to 4 weeks in the process of incubation then it is transformed into other successive stage. (3) Symptomatic stage; in this the infected person shows its visible symptoms in the form of coughing, fever, etc. during period of proliferation. (4) Critical stages; the infected person starts facing clinical adversaries leading to uncertain outcomes may be recoveries or succumbing to the disease. During the critical stage highly supportive treatment, ventilators and other accessories may be helpful to overcome the disease and person may recover. So, the existing preventive and curative system may also determine level of morbidity and mortality. In the countries the less effective systems proved insufficient to manage the COVID 19.

The pace of proliferation has a number of catalytic, complementary, supporting and accelerating factors; with increasing technologies, fast mobility, efficient transportation means, better system of transportation, congenial viral growth environment, seasonal factors such as winter, low temperature, less humidity, interconnected subways, speedy aerial journeys, huge goods transfers under the regime of larger international trade volume, the time of spread of the pandemic remained less relative to worlds earlier pandemic history.

3. IMPLICATIONS OF PANDEMIC

It directly and indirectly has affected life of human beings, their consumptions, labour force participation, leisure activities, social capital formation, social activities, and religious activities. The human being change their behaviours towards resource allocation and time allocation. At the state levels respective government institutions and formal organisations devised special regulations and special emergency plans so as to ensure safety, health of human beings. The states had to rely upon special social contracts with their citizens. This formal system may lead to closure of a number of businesses, entrepreneurs. Transportation systems, interaction patterns and movement of individuals is either ceased or reduced to very low levels. This adversely affects economic activities, production activities, services sector activities, tourism, hoteling, employments, and incomes of the people. Overall production reduces, economic growth has come down and over the time may decline rapidly in continuation of the current situation, challenges of COVID 19. With the slow economic activities' employability, resource exploitations, natural resource utilisation, industrialisation and savings has been reduced. The agriculture sector is facing more challenges with less attention and participation of individuals with low mobility, thereby, overall productivity may be reduced.

The less participation in agriculture activities including reduction in demand, marketing of products may reduce overall accessibility to product and vice versa, may lead to suboptimal use of resources, less income and less availability of disposable income for the persons involved in agriculture sector. Construction sector's activities have come to low level, its consumption of inputs from feeding industries and vendors is

reduced, employment level is reduced. Use of cement, stone, bricks, steel, wood, sanitary material, electrical material, employability of respective labour force has reduced. The pandemic on one hand has a number of implications on human lives and economies and on the other hand exposed systemic and structural weaknesses of the world community and current system of governance that is insufficient and incapable to manage any future pandemic, which needs a serious realisation, reordering, re-organisations and restructuring of the existing system so that humanity may be saved from any future pandemic disaster. This pandemic has a number of implications on the economies and individual life.

3.1. Philanthropic Activities

Philanthropic Activities and service-related social activities seem increasing on higher trajectory. Financial contribution of the people towards formal Funds established under the auspices of states or state entities in different countries have fetched huge funding from the people. Formal philanthropic organisations have contributed a large in distribution of resources, food, non-food items, urgent cash needs of the needy and affected persons. People are contributing financially through these formal organisations. Besides, people are also contributing through informal channels and direct assistance in different parts of the world and countries for assistance of needy and affected people. Direct distribution of; food item, clinical items including masks, sanitisers and cash distribution is also observed in a number of areas in different countries. In Pakistan goods and services of billions of Rupees have been distributed and contributed.

3.2. Donors Response

Donors response have been encouraging to combat the pandemic. This includes sensitising the world rich countries on the need of funding the developing countries besides trying to manage their own. IMF had in acted two such facilities Rapid Credit Facility (RCF) available for the least developed countries and Rapid Fund instrument (RFI) for middle income countries. Along with this G20 countries have announced the debt relief. World Bank and other donor agencies such as Asian Development bank have also announced significant funds for fighting against the COVID-19 through saving lives and livelihood. Other multilateral forums such as EU have also announced packages for developing countries.

3.3. Religious Activities

Religious activities time allocation and practices of individuals has increased, with the pandemic. Informal religious activities by increasing time allocation in non-obligatory religious activities have increased. The societies with larger number of religious persons showed increase in their average time allocation to religious activities and resource allocation to philanthropic activities. Time allocation to prayers, recitation of holy books, dissemination of knowledge and special verses for seeking divine help have been increased. Communication and dissemination of religiously motivated messages have increased in social media. Reliance on divine assistance and spiritual therapy in different parts of the world shows overall increase.

3.4. Social Capital Accumulation

Social capital accumulation at the level of individuals, organisations, institutions, and state may be affected with the frequency of allocation of time and resources for affected individuals, thereby, trust level among the individuals and reciprocating individuals, organisations, institutions, and states increases. This social capital may be instrumental in future relationship building amongst the individuals and states. The intrastate social capital and interstate social capital may be accumulated with a particular type of activities generating social capital for future time period. The countries, individuals, organisations, and institutions extended their resources, time, technical assistance to other COVID 19 affected individuals, states and parts of the countries have developed a higher level of social capital for the reciprocating countries and respective citizens. Few countries have provided the technical assistance to other countries in the region and across the region, which will accumulate social capital amongst these interacting countries. Reportedly Chinese government has delivered technical assistance in the form of medical toolkits, clinical materials, preventive materials, and curative kits to a number of adversely affected countries have accumulated higher social capital amongst them.

4. MODELS OF PANDEMIC MANAGEMENT IN THE WORLD

The pandemic has spread in the world over the time. People and governments in different countries have perceived, reflected, reacted and managed pandemic in different manner, few countries prioritised human beings' safety at top of their social, economic, political, labour and consumption of people and adopted special provisions of social contract between the state and the citizens. Few of the countries trusted and expected more responsible attitude from the citizens and kept government role in background in wait and see. Few countries applied piecemeal measures, a mix of government regulations and citizens' responsibilities. The efficacy of the model may be assessed in line with total population vs. the affected part of the country. The COVID 19 has also exposed a number of countries in specific and the world community in general that their capacity to combat and manage any pandemic is insufficient and weak.

Significant Models of COVID 19 management in few of the Countries are referred in the following.

4.1. United States Model

United States Model of Pandemic Management seems more or less similar to the European Model. The spread of pandemic was through multiple entries in the country through different modes and persons across the world specially, European countries. The pandemic spread in populous cities with multiple interactions and exposures. Initially the government trusted the people and prioritised citizens socio-economic and political rights as per the conventional model of social contract. The early response of the citizens remained passive as like other European citizens and the prioritised their social, economic and consumption needs and continued their normal activities with limited and partial response to the pandemic. In this mode the pandemic spread in big cities of US, being an exponential character disease, it tacitly entered into a large number of people, after gestation period it entered into stage 3 of the pandemic. The government invoked its emergency role at later stages, then preventive

measures were overpowered by a large number of infected persons. The number of infected persons and available capacity of the government do not match, which ultimately left more unattended persons below desired level of management. At the moment 1,089,726 number of persons have been infected and 63,592 number of persons have died respectively in US. The infrastructure, government institutions, capacities and expected role of the government remained below. The total number of collateral loss with respect to population proved suboptimal as against total population of 328.2 Million, the infected and deaths are1,309,541 , (0.040 percent) and 78,794, (0.024 percent) respectively, (Dong et al.. 2020 Feb 19; U.S. Census Bureau; Worldometer, 2020, May 2).

4.2. European Model (Italy and Spain)

The spread of pandemic started in Italy and Spain in last week of January 2020. The COVID 19 spread in other parts of the Europe; France, UK, Germany other countries in January-February 2020. For the working convenience in the analysis the higher valued countries from the EU are taken instead of all the countries, as most of these countries have a number of similarities in governance system, regional contiguity, inter countries mobility, interconnectivity, subways, frequent transportation, intra region movements, cultural commonalities, membership of European Union etc. The citizens and governments of these countries perceived, reacted, and managed the pandemic in conventional manner within the prevailing social contract prioritising people's socio-economic and consumption priorities. The governments expected the more responsible attitudes of the citizens for participatory management. This model delayed the response time to the pandemic management, and a large number of people were infected and lead to deaths.

The activities of the people remained in reactive mode, which increased the number of infected people beyond the existing capacity of emergency management, in the hospitals, social security institutions, and other governance framework. This model could manage partially in the existing framework, and had to switch over to special provisions of the social contract at later stage, which was in fact too late to manage collateral damage to the lives of people, service delivery of the governance institutions, economy and state etc. The collateral human loss against the total population of 60.3 Million is infected persons are 218, 268 (0.36 percent) and deceased persons are 30,395 (0.05 percent) in Italy. According to (MD et al., (2020) due to scarcity of efficient shielding procedures at beginning among others infected, 10,000 were health workers. Moreover 101 physicians died as a consequence. Another important challenge faced was regional shut down of all outpatient visit activity in hospitals. The last challenge is based on argument from recent literature which indicates that the spread of Covid-19 is projected to suffer with other awaited pandemic viral concentrations in the upcoming months. In Spain, the collateral human loss against the total population of 46.94 million infected person 223, 578 (0.47 percent) and deaths 26,478 (0.056 percent) respectively.

4.3. China Model

The COVID 19 spread in China in 2019 November to 2020 April, initially the pandemic spread in Wuhan Province. The pandemic was about to spread at large scale in other parts of China and to other parts of the world, the Chinese Government invoked their special social contract provisions and locked down the whole province of Wuhan and

sealed all of the citizens' movements in and from the region. The government took over their all responsibilities of food, consumptions, residence, hospitalisations, and allied responsibilities. Simultaneously, the Chinese government disconnected the interaction, connectivity, aerial, land, subways, etc., of Wuhan with other parts of the China and the world. (Chinese Ambassador to Pakistan interview ……). According to Feng et al. (2020) most robust and efficient measures to contain Covid 19 are regular vigilance, initial recognition, early diagnosis and treatment, effective screening, and isolation. Through employing these strategies many companies in Shenzhen resume their work after 17 February. This management model proved successful to open the province of Wuhan in specific and the Country as a whole in general. The Chinese Economy was closed initially on 8th January 2010; social, economic, leisure activities, of the people during the pandemic management process has resumed after April 8, 2020. Collateral damage to human life against the total Chinese population of 1393 Million includes infected persons 83,994 (0.006 percent)) and deaths of persons 4,637 (0.00033 percent) respectively.

4.4. Pakistan Model

The pandemic reached the country through multiple means and channels in February 2020 onward in 2020. The government adopted measures based on prioritising the life security of the persons over their rights of socio-economic and consumption. Special social contract's provisions are invoked in the governance system to manage pandemic in the country. The government announced lock down at national level; disconnected with rest of the world, in 3rd week of April 2020.

And ceased inter cities and partially intra-city movements, social interactions, economic activities, and labour movements. The government introduced a short-term social security program "Ehsas Program" for the pandemic period and reduced morbidity level. Besides the government, the philanthropic organisation, informal and formal philanthropic activities abridged the gap of income and consumption of poor and needy people in the country. Higher time allocation for seeking religiosity cantered divine assistance and spiritual therapy has been observed. However, later on the government has eased out lock down, which may increase the collateral damage to the human lives. At the moment there are around 29,465 (0.013 percent) infected persons and 639 deaths, 0.0003 percent against the total population 212.2 Million of the country.

Table 1

Comparison of Morbidity and Mortality in 4 MODELS

Indicator	US	Italy	Spain	China	Pakistan
Total Population	328.2 million	60.36 million	46.94 million	1.393 billion	212.2 million
Infected Person	1,309,541	218,268	223,578	83,994	29,465
Deaths	78,794	30,395	26,478	4,637	639
Infections Percentage of Population	0.040%	0.36 %	0.47 %	0.006 %	0.013 %
Deaths Percentage of Population	0.024 %	0.050 %	0.056%	0.00033 %	0.0003%

Sources: NPR Website on COVID 19, Business Insider Website, Nations Online Website, US Census Bureau accessed on 10-05-2020.

5. GAPS IN THE EXISTING MODELS

A number of gaps existed in different countries during management of the pandemic COVID19. The world community tried to combat and mange pandemic by utilising its own resources and with assistance of other. The net adversaries on the human lives and collateral damages remained different for various countries due to difference in the comparative advantages. It is assumed that all the countries have same level and human resource and same level of technology and clinical capacity to manage the COVID 19. Despite the fact that EU and US seemed having comparative advantage over others, which could have regressed our findings more, however for academic convenience these assumptions are made. The comparison shows that as a percentage of total population the US has 0.04 percent, infected persons, Italy has 0.36 percent infected persons, Spain has 0.47 percent infected persons, China has 0.006 percent infected persons, Pakistan has 0.013 percent infected persons. The deaths as a percentage of total population of the country; US has 0.024 percent deaths, Italy has 0.05 percent deaths, Spain has 0.056 percent deaths, China has 0.00033 percent deaths, Pakistan has 0.0003 percent deaths. Despite better medical facilities, relatively higher human capital level, higher living standards, higher education level, better housing facilities, higher per capita income, developed economies, collateral human losses are far more in Spain, Italy, and US as compare to Pakistan and China. This also shows that other than advancement there are some other important factors that acted as a shield to the pandemic and collateral human losses. The comparison of the model adopted by different major countries are made and identified that the countries with low or very low percentage of collateral and lives damage by the pandemic have following advantages while others have gaps in these areas.

5.1. Approaches of Social Contract

Adopted by the countries showed different outcomes against the pandemic, the countries adopted conventional approaches prioritising citizens' voluntary participation and taking over management by the people, comparatively late responded to manage, combat the pandemic, faced more collateral damage, life losses, economy losses and more time period of prevalence of pandemic. The countries adopted non-conventional approaches prioritising safety of lives of people over their civil rights, application of special provisions of social contracts could better manage, had lesser collateral damage, lives losses, morbidity density, and shortened span of management, improved recovery time period and less socio economic losses. China and Pakistan adopted special social contract provisions for management of the pandemic, the USA, and European Countries (Italy and Spain) adopted conventional social contract approaches at initial stage.

5.2. Emergency Social Security System

Funds, or alternative system could have assisted continuation and persistence of the combat and management approaches. The countries faced more collateral damage, life losses, pandemic span, unsustainability in the approaches in absence of special social security system, financial assistance for food and necessary goods on the part of the government or the private sector, philanthropic institutions; formal and informal. In the US availability of this system is week and people will have to mainly rely on their own

income and savings in case of any pandemic and emergent challenge. Therefore, the people were unable to keep them locked up for longer time and remained out of homes that increased their interaction with others and ultimately infected cases increased many folds. In the EU, this system is partially available, the people adopted the lock down in constrain, the time the government intervened at stage 3 remained instrumental in reducing morbidity and mortality.

5.3. Operational Approaches to Manage

The countries planning and implementation of COVID 19 remained different with respect to response time, use of tools, movements of people for labour force participation, economic activities, leisure, travelling, transportation, and interaction with other fellow human beings. The USA and European Countries on average adopted delayed response implementation plan and adopted strict restrictions of movement and interaction with other people at later stage 3, while the Chinese and Pakistani governments adopted these approaches at early stage before entering the countries into stage three.

5.4. Alternative Medicine System

In the developed countries such as USA, European Countries, formal allopathic medicine system of treatment is very much developed and monopolised all of the economies. This system works well in the normal circumstances, based on clinically tested results approaches. The pandemic outbreak takes some time to develop remedial measures, transitional period has to face collateral damage, as being occurred in USA and major Europe. Besides, alternative medicine system are based on perpetual principles, mostly linking with the symptoms which may be effective remedies of pandemic. A number of ethno medicines, Tibe Nabvi, Unani , Homeopathic, Spiritual therapy exist in different parts of the world. In Pakistan Alternative medicines system has a number of options for the infected persons, who got the disease and achieved successful remedies from alternative medicines. The accessibility is easy, monetary and time cost is low in the system , therefore, a number of infected persons adopted it and benefitted.

5.5. Use of Philanthropic Potential

Use of Philanthropic Potential of the economy in various countries remained different. A number of countries having high level of philanthropic potential get better manage the complete lock down by support for food and other necessities. The people remained relatively more compliant and cooperative in such societies, compare to the societies with low level of philanthropic potential and institutions. The people were pushed by their needs for consumption of food etc. to allocate time for labour force and economic activities. In Pakistan, these philanthropic activities are used as a hedging tool to keep the poor and needy people at their homes, despite their very low-income level. Although, philanthropic activities were also available in the EU and USA, but in low quantity and less consistently relative to Pakistan. In Pakistan billions of Rupees goods and services were distributed to poor and needy people in the pandemic. Relatively more time and money allocation for seeking religiosity cantered divine assistance and spiritual therapy is observed.

5.6. Religiosity Level

Religiosity level and adoption of religious practices by individuals, groups and community increased their spiritual dependence, psychological confidence and moral support from co-religious groups and people. In the countries with higher religiosity base a greater number of people practiced religious activities, worship, recitations, and contributions to seek divine blessings. The religiosity is also considered as an effective way of seeking divine closeness, forgiveness and help in difficult time. The immunity level of individual to combat the disease increased with more confidence and spiritual therapy, thereby, overall morbidity and mortality remained low in these countries. In Pakistan time allocation to religiosity and worship activities; study divine books, recitation, prayers etc. at individual level increased to seek divine blessings and help in difficult times. Despite a number of disadvantages from other EU and US countries *vis a vis*; better hospitalisation, better environment standards, better cleanliness level, better living standards, better medical facilities, better food supply system and markets etc. morbidity and mortality in Pakistan remained far lower than the comparable ratio with the formers.

6. STRATEGY FOR MANAGEMENT OF PANDEMIC

Strategy for Management of Pandemic may be devised at 4 level: (i) Local Management, (ii) National Management, (iii) Regional Level Management, (iv) International level Management based on following dimensions.

A four-pronged strategy to manage pandemic may be adopted at local level, national level, regional level, and international level. The pandemic is a multiple nature problem with its implications on human bodies, animals, behaviours of human beings, consumptions, leisure, labour activities, employments, working in industries, livelihood, basis of income, preventing measures and curing methods, medical treatments, etc. Any other future pandemic may occur with the similar reasons or additional causes arising out of human technological development, conflicts of human being with other natural beings, more exposure to other planets, planned and unplanned outcomes of the human efforts, vested interests initiatives. Therefore, a holistic approach of strategizing is required. The countries are directly and indirectly inter-related to each other on these areas through trade, tourism, and in other modes, which affects a number of countries simultaneously. Therefore, the strategy may be chalked out for an individual country with its individual inputs and collective inputs from other countries of the region and world community or a collective strategy by the world community. A number of parameters may be adopted at various levels and used at multiple tiers. The parameters may be applicable in individual capacity and in Toto along with interplay of other factors in the dimensions. Social contract between the people and the state is usually executed through different state institutions and its governance systems at different levels. A number of states have their local governments institutions responsible for emergency services disaster management, at certain parts the provincial governments or state/colony government are looking after these services, while in some parts national level governance system is in vogue to respond such as pandemic, in some cases the regional institutions are also having tacit provisions to assist the national government or collective response may be adopted. The international response level may be generated to assist each other to prevent, mange pandemic and cure the adversaries of the pandemic. Since the government institutions

and governance system in the context of pandemic work at four tiers i.e. local, national, regional and international, therefore, may be realigned and adopted on the following lines for prevention and management of pandemic.

6.1. Social Capital Cantered Technical Assistance

Management system and plan may be adopted by the countries individually or jointly. The challenge may be considered, recognised, and owned jointly by various countries and then a joint strategy may be adopted in various dimensions to manage and combat pandemic. Riley (2008) demonstrate that irrespective of their dissimilarities in various aspects countries like China, Costa Rica, Cuba, Jamaica, Japan, Korea, Oman, Panama, the former Soviet Union, attained rapid rise in life expectancy while Income per capita was comparatively at a low level. Riley further maintains that it was possible through investing in infrastructure, health and "social growth" without democracy or an unambiguous unease with communal justice. The preventive and curative parts of the pandemic in a country may be managed with the assistance of other countries, including regional, neighbouring, or international community through technical assistance in the form of (a) Medical Equipment, (b) Medicines, (c) Human Capital. Social capital cantered reciprocity may be utilised for recovery and curing at the stage of technical assistance, borrowing medical equipment, machinery, test kits, ventilators, medicines, human capital exchange, sharing knowledge, best practices, sharing experiences, sharing success stories, etc. This may be done at the level of state to state, organisations to organisation, community to community, group of experts to group of experts, doctors to doctors, para medical staff to para medical staff, medical engineers to medical engineers' level through horizontal and vertical communication by a direct interaction in a community of practitioners, formal government channels, diplomatic channels, etc.

The countries may take technical assistance from other countries having comparative advantages, the countries already experienced or passed through pandemic or countries safe from pandemic having reaction time etc. The countries already experienced pandemic might have developed better, and sufficient number of medical equipment and medical toolkits might be underutilised can share, donate to the other countries fighting active pandemic brunt. The medicines and therapeutic developments, successful experiences, may be shared with the countries facing active onslaught of pandemic, curative and preventive medicines, diets, methodologies, practices, procedures and treatments may be transferred to other countries so that they may avoid time and energy from reinventing the wheel. The human capital; the doctors, nurses, paramedical staff and other technical hands might have developed higher human capital during defense of pandemic onslaught, developed skills, techniques, practices that may be transferred to other parts of the world, the state entities, professional human capital etc. A number of business organisation, associations of industrialists, traders, labourers might have a preexisting social capital which may be transformed into a technical assistance on these occasions. Normally the pandemic transfers in a centrifugal manner or sporadic from one point to other and then so on, which has a time lag of spreading in different geographical areas over the time, that provides reaction time to other parts of the world and also elimination from one part may leave a large number of medical equipment, tools , test kits, medicines unutilised or underutilised, that may be transferred to the actively hit part of the world by the pandemic.

6.2. Community of Practitioners

May be constituted at multiple level of social networking in different dimensions, the potential may also be capitalised for transfer of technology, best practices, methodology, best procedures from the one with comparative advantage to the one with less comparative advantage. These networking may play bridging role to the medical teams across two different countries and areas. This may be done at the level of state to state, organisations to organisation, community to community, group of experts to group of experts, doctors to doctors, para medical staff to para medical staff, medical engineers to medical engineers' level through horizontal and vertical communication by a direct interaction in a community of practitioners, formal government channels, diplomatic channels, etc. may be facilitated to join a number of similar platforms, network groups, with the help of web search engines, information technology companies; for example, Googles, Facebook, What's app, WeChat, imo, etc. these may be having basic data of a number of technical experts; doctors, paramedical staff, medical engineers, practitioners etc. Around 25 type of interactions amongst curative medical persons of both the sample countries i.e. Comparative Advantage Countries vs. Less Advantage Countries exist however, more effective and congruent are 5 relationships viz. a viz. Medical Specialist (MS LA) vs. Medical Specialist (MS CA), Nurses (N LA) Vs. Nurses (N CA), Paramedical Staff (PS LA) vs. Paramedical Staff (PS CA), Medical Engineer (ME LA) vs. Medical Engineer (ME CA), Managers (M CA) vs. Managers (M LA). The interaction of Medical Engineer (ME CA) with all the remaining five of Less Advantage Countries are also relatively useful. However, remaining relationships may be useful with lesser degree, which may be enhanced over the time and concentration. Relationship of all Managers of Less Advantage Countries with all the other groups of comparative advantage countries; Medical Specialist, Nurses, Para Medical Staff, Medical Engineers, Managers may be relatively useful.

Table 2

Community of Practitioners Interaction from Country with Comparative Advantage Vs. Country with Less Comparative Advantage

	Country with Comparative Advantage				
Country with less advantage (LA)	Medical specialist (MS CA)	Nurses (N CA)	Paramedical Staff (PS CA)	Medical Engineer (ME CA)	Administrative Staff (AS CA)
Medical Specialist (MS LA)	(MS LA) vs. (MS CA)	(MS LA) vs. (N CA)	(MS LA) vs. (PS CA)	(MS LA) vs. (ME CA)	(MS LA) vs. (AS CA)
Nurses (N LA)	(N LA) vs. (MS LA)	(N LA) Vs. (N CA)	(N LA) Vs. (PS CA)	(N LA) Vs. (ME CA)	(N LA) Vs. (AS CA)
Paramedical Staff (PS LA)	(PS LA) vs. (MS LA)	(PS LA) vs. (N CA)	(PS LA) vs. (PS CA)	(PS LA) vs. (ME CA)	(PS LA) vs. (AS CA)
Medical Engineer (ME LA)	(ME LA) vs. (MS LA)	(ME LA) vs. (N CA)	(ME LA) vs. (PS CA)	(ME LA) vs. (ME CA)	(ME LA) vs. (AS CA)

6.3. Social Capital Cantered Implementation Plan

Social capital-based strategy may be adopted, the social capital accumulated across the individuals, groups, community, organisations, institutions, states mutually and across diagonals ante pandemic and post pandemic and in the process of pandemic. Lee and

Kelley (2000) emphasise that in order to determine pattern of disease there is need to focus on both technological change and social conditions linked with globalisation. The individuals, groups, organisations, and states may adopt cooperative-cooperative game. The trust may be poised on the basis of the earlier role of players in spreading disease, inability to manage, unwillingness to containment of pandemic, capacity and will of the alternative players. Social capital in a country exists in a number of dimensions, which can be utilised for pandemic management, a 16 dimensional social capital matrix identified (Shah et al., 2010, 2011) for each of the management levels i.e. local, national, regional, international with respect to; individual, community, organisations, group, family, government, states etc. for the purpose of Awareness, Prevention, Implementation, Cure etc. The social capital may be capitalised at initial level for creation of awareness about the pandemic, its knowledge, dimensions, implications, types, occurrence, circumstances, etc. The social capital is tabulated in a 16-dimensional Social Capital Matrix form, that identifies existence of social capital potential in different dimensions and areas of the society.

Table 3

Social Capital-based Awareness and Implementation Plan

	Other State	Other Organisation/ Institution	Other Group/ Community	Other Individual
Experienced State	Experienced State vs. Other State	Experienced State vs. other Organisation/ Institution	Experienced State vs. Other Group/ Community	Experienced State vs. Other Individual
Experienced Organisation/ Institutions	Experienced Organisation/ Institutions vs. Other State	Experienced Organisation/ Institution vs. other Group / Community	Experienced Organisation/ Institution vs. another Community/ Group	Experienced Organisation/ Institution vs. Other Individual
Experienced Group / Community	Experienced Group / Community vs. Other State	Experienced Group / Community vs. Other Organisation/ Institution	Experienced Group / Community vs. Other Group / Community	Experienced Group / Community vs. Other Individual
Experienced Individual	Experienced Individual vs. Other State	Experienced Individual vs. Other Organisation/ Institution	Experienced Individual vs. Other Group / Community vs.	Experienced Individual vs. Other Individual

This social capital may be capitalised for creation of awareness campaign regarding pandemic, amongst the human beings across the world, regions, across the countries, communities, organisations, institutions, societies, groups, individuals. This social capital may be used across the countries, based on the knowledge, observations, experimentation, a country, residents of the country experienced during the process of pandemic. They may have communication, directly and indirectly in the following dimensions: experienced state vs. other state, experienced state vs. other origination/ institutions, experienced state vs. community/group of other states, experienced state vs. individuals of other states. Experienced Organisation/Institution vs. Other State, Experienced Organisation/Institution vs. Other Organisation/Institution, Experienced Organisation/Institution vs. Other Community/Group, Experienced Organisation/ Institution vs. Other Individuals. Experienced Community/Group vs. Other State,

Experienced Community/Group vs. Other Organisation/Institution, Experienced Community/Group vs. Other Group/Community, Experienced Community/Group vs. other Individual. Experienced Individual vs. Other State, Experienced Individual vs. Other Organisation/Institution, Experienced Individual vs. Other Group/ Community, Experienced Individual vs. Other Individual. The data of all these are available in most of the countries national data bases in integrated or scattered form, which may be utilised for development of contacts, interaction, communications, messages dissemination, implementation, monitoring, feedback etc.

After awareness, the countries may plan preventive and curative measures to combat pandemic; this may be done in the above social capital matrix form, it's implementation, monitoring and feedback mechanism may be adopted across all the above players.

6.4. Legal Framework

For implementation preparation and implementation of pandemic is required at level of individual countries, region and international community. A number of missing links and gaps exist in the current legal framework of the world. Lack of insufficient legal framework, legal provisions, no congenial by laws, rules and regulations and procedures, create a gap for the field implementation machinery and resistance from the people for handling any pandemic and government executive orders. As happened in the case of USA and EU. Congenial and supportive Legal Framework may be developed over the time and space, areas, geographical parts, administrative managerial units, governance units, in a number of states, governments, and levels across the world. In the pandemic specific, spontaneous, unitary type of governance system is more congenial, that may be aligned with a number of legal delegation of powers, restructuring, realignment, and authorisation of enforcement of quick reaction, actions. Delegation of powers to local representatives of the government institutions needs to be done for quick response and pooling of locally available resources. So a systematic working is required for re-alignment of the laws, bylaws, rules, regulations, procedures etc. A number of amendments, deletion and addition in local laws, bylaws, criminal laws, Municipal Laws, Law and order related statutes, bylaws, regulations, procedures may be identified and amended accordingly. For example, a number of powers were delegated to Deputy Commissioner at the level District in Pakistan to manage emergency and exercise powers for quick response and effective implementation. Similarly, at the level of Provincial Government, all the coordination, representational and notifying authority has been delegated to Relief, Rehabilitation and Settlement Department, Government of Khyber Pakhtunkhwa Pakistan, under its umbrella all the executing agencies work

6.5. Specialised Financial Delegation of Powers

Specialised Financial Delegation of Powers would be required for urgency-based procurements, delegations to lower levels, local levels, generation of finances, making emergency arrangements through public private partnerships etc. Special empowerment to levy emergency restrictive laws and ensured compliance and

cooperation of citizens may be made. The pandemic affected country and its area of operation demand quick reaction to the outbreak of pandemic, which on the part of government is done by its representatives normally at senior level needs to be delegated to local representative of the government for congenial exigency of services.

6.6. Pandemic Fund Development

Pandemic Fund Development may be done at regional and international level so that resources may be made available for research, developments of toolkits, medical equipment, methods of treatments, vaccines development, medicines development, assistance to the affected parts of the world. This fund may be used to visualise, meet, and protect and counter future pandemic spread and its counter measures. This fund may be developed through contribution to be levied on the export of medical equipment, or G 20 Countries may contribute on annual, quarterly, or biannual basis. Any other appropriate mechanism may be devised for development, contribution, management, and distribution of money from the Pandemic Fund. This Fund may be linked with any other health, or disaster related global economic activities.

6.7. National Emergency Social Security Fund Development

National Emergency Social Security Fund Development in each country may be made through coordination between the government and non-government institutions, philanthropic organisations. A framework may be developed to constitute a social security fund, its management, its operation, in normal times and in case of pandemic. An integrated operational framework may be devised for the public and private sectors with standing operating procedures. Emergency areas of operation, domains, activities of operations and other allied activities, provision of social services, shelters, health services, food services, other allied management plans may be made prior to any pandemic. In the normal period of time these funding streams may be used for other already notified purposes, however in case of emergency may be used for management and mitigation of pandemic effected.

6.8. Private-Public Partnership Based Management System

Private-Public Partnership Based Management System may be developed, through involvement of a number of private sector organisation, philanthropic organisation, NGOs, International NGOs for identification of pandemic effected, awareness campaign, medication, testing, employment, food supply in case of quarantine, lockdown. Rosemberg (2020) explains the role of hospitality industry in providing quarantine spaces for those infected with coronavirus and providing financial relief to government. A number of organisations exist with different structures, forms with varying operational mandates for emergency reliefs and assistance to the effectees of any emergency, pandemic etc. Operational management in different areas, parts of the countries may be made responsibilities of the partnering players either government or the private sector. The responsibilities of preventive measures, food supply, curative measures, may be allocated or divided amongst the partners so that over employment or under employment of resources is avoided. This may also help the government to plan and map things on

certain basis of resources against the clear demand of services and goods. A huge philanthropic potential exists in different countries, which may be made formal part of preparation, combat efforts and pandemic management. In Pakistan goods and services of billions of rupees are being distributed and contributed by philanthropic organisation in different parts of the country. In other parts of the world this philanthropic potential may be used even across borders.

6.9. Alternative Medicines System (AMS)

Alternative Medicines System (AMS) may be developed for future challenges of pandemic, probability of which would be higher over the increasing scientific experimentation, exposure to other planets. The unforeseen circumstances and challenges may lead to an unexpected outcomes of pandemic, sole dependence on the existing formal medicines system would need reaction time and then the humanity may have to face huge collateral damage. The developed alternative medicines system would help reduce reaction time, transitional period losses.

6.10. Artificial Intelligence (IA)

Artificial Intelligence (IA) embedded system of curing, medical treatment and patient management may be developed for the pandemic affected patients and the part of the world. Roman et al. (2020) assess the analytical authenticity of model forecasts for COVID19 and discovered that IHME predictions regarding daily death numbers was found inaccurate as much of 70 percent of time. Furthermore Batista (2020); David and Moore (2004) employed SIR and logistic growth model to investigate the size of coronavirus epidemic. Similarly, artificial intelligence may be used in the medical equipment operations, patient managements, treatment, transportation of materials, patients, treatments, hospitalisations, servicing etc. Use of artificial intelligence may be made in the development of equipment, operations of equipment, medication, etc. Artificial Intelligence system may be used in management, operation and disbursement of Pandemic Fund and National Fund for pandemic. The embedding of artificial intelligence would reduce cost and time of management of pandemic across the world in general and the affected country in specific. It may be instrumental in reduction of hospital casualties occurring due to patient-doctor and curative team interaction and management.

6.11. Media Role

Media Role in the epidemic may be made aligned with a more proactive planning of the world, media persons' prior protocols and standing operating procedures may be developed and made mandatory for them to study at the time joining profession. Even may be made part of the syllabus of the media professionals, orientation courses may be arranged. Psychological up keeping and higher confidence level is instrumental in immunity against pandemic, which may be increased with better moral and optimism. The media's role in propagation of negative pictures adversely affects confidence level of the individuals too. Therefore, the media persons may contribute in fighting against pandemic.

Table 4

Four-pronged Strategy of Pandemic Management at Local, National, Regional, International Levels

Activities	Local	National	Regional	International
Social Capital Centered Technical Assistance				
Community of Practitioners				
Social Capital Centered Implementation Plan				
Legal Framework				
Specialised Financial Delegation Of Powers				
Pandemic Fund Development				
National Emergency Social Security Fund Development				
Private-Public Partnership Based Management System				
Alternative Medicines System				
Artificial Intelligence (IA)				
Media's Role				

7. CONCLUSION

The existing infrastructure, strategy, governance framework, available preventive and curative medical system performed below the expected level and huge collateral loss to human being occurred, especially in USA and Europe. The existing system of governance, medicines, and legal framework in USA and EU performed far below China and Pakistan with respect to collateral damage. Therefore, an effective, holistic, representative strategy based on current experiences is required for the world. Existing leadership model may be reviewed for pandemic management. A holistic strategy may be prepared by creating ownership, recognition and realisation and management of pandemic at international level, regional level, national level, local level with individual and joint efforts may be done more effectively. The joint and individual level implementation strategies may be adopted for combating pandemic. Development of appropriate pandemic oriented Social Contract, technical assistance across the world, networking of community of practitioners, , capitalisation of social capital, realignment of philanthropic potential through private public partnership, legal framework, social capital centered implementation approach, appropriate delegation of powers, pandemic fund development, national special social security fund, artificial intelligence embedded system development, realigned role of media, would generate a more efficient, more competitive and more effective system of management and combating pandemic specially COVID19 across the world and individual countries. The COVID 19 may better be managed in the remaining parts of the world with adoption of this strategy. This may be taken a base framework for any future occurrence of pandemic.

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