Changing Paradigm Shift in Health Care Systems during COVID19: Measures to Strengthen

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Abstract

The objective of this paper is to critically examine the existing condition of Indian health systems and health care service delivery mechanism and its effectiveness during COVID-19 and what can be done to further strengthen the system to make more efficient which can meet the requirement and needs of the country. COVID-19 has exposed the vulnerability in the healthcare system and reiterated the emergent need of affirmative, effective and active action so that the robust, collaborative, scalable, and agile digital healthcare infrastructure could be established.COVID-19 was declared as global pandemic by WHO due to adverse and critical situation that the world is facing and made this period as the one of the most difficult periods of recent history. India and its health system have exposed its vulnerability and raised serious alarm for the requirement of effective health care system to combat critical pandemic situation. It has caused chaos as well as raised various concerns and raised on existing health care systems, facilities and service delivery all across the globe. More than fifty million were reported positive and lakhs of people have already died, still the pandemic is in peak phase. It has revealed the fragility of the health care system and associated services all across the globe including India, which has forced countries to make difficult choice on meeting the needs and requirement of the people and how much critical to face to these and arrange the alternatives. Health System and the health policies associated with this plays pivotal role in determining the health care services delivery, utilisation and their affected outcome. In India, Health is in concurrent list according to the Constitution of India, therefore there is much flexibility in law making by Central and States. Though, the majority of guidelines related to health are issued by Central Government, but the final implementation of these measures, policies ultimately lies on the state governments and enjoy their final prerogatives in these matters. Despite the huge effort of Central and State Govts and full backing of communities, public and private healthcare systems both are fighting an uphill battle against a largely unknown enemy i.e. COVID-19, and also facing acute shortage of adequate personnel and resources. Therefore, its need of hour to increase health expenditure and investment on health sector and develop indigenous and find innovative methods to make health as universal coverage. This paper has recommended some effective measures for strengthening the health system and changes in health care service supply chain so that India can effectively combat these types of larger outbreak and pandemics in future

Keywords: COVID19, Pandemics, Changing health System, Impact on Health system, COVID19 impact, healthcare delivery

Background:

In the history of humankind that pandemics have afflicted civilisation from time to time and the earliest recorded pandemics was the outbreak of Plague during the Peloponnesian War in Athens (Capital of Ancient Greece) in 430BC. Though there are various views about the causes and spread of this pandemic, but majority believed it was due to Typhus or Typhoid. It passed through Libya, Ethiopia and Egypt and Athenian walls and caused death of the two-third of the population. Some of

the other major pandemic which has changed the course of human history include Antonine plague (165 AD-180 AD), Black Death or bubonic plague (1347 AD-1351AD) which spread throughout the Europe and caused death of more than 25 million people consisting greater numbers in Asian continent and especially in China from where it was originated. In the year of 1665, the great plague of London caused death of 20% of London Metropolitan population. SARS (Severe Acute Respiratory Syndrome) outbreak which has some similarities happened in 2003 which was started with bats, spread to cats and then humans in China followed by 26 countries. Major symptoms of SARS were found to be respiratory problems, dry cough, fever and head and body aches and is spread through respiratory droplets from coughs and sneezes. Therefore, these pandemics had major significant imprints on human society along with mankind history from killing large global population to causing human to ponder larger questions about life. For SARS, WHO and affected countries took effective measures such as maintain physical distance, using mask and rapid check and detection of the cases, Quarantining the case among these measures quarantine proved highly effective to improve outbreak response and these lessons were used to keep diseased like H1N1, Ebola and Zika under control and combating these very effectively.

Introduction:

A strong health system is the best defence against any outbreak of greater extent of pandemic. The outbreak of COVID-19 has thrown an unprecedented challenge to the world and people. This pandemic has stretched the infrastructure related to health of the advanced and most developed countries which caused economic recession unparalleled in the recent times. Therefore, India has also adversely affected and exposed the critical vulnerability of the existing health care supply chain and service delivery mechanism and preparedness to combat to critical and adverse pandemic situation. Covid-19 has not only threatened health system, health care services but also sent economy in to a tailspin. World Health Organisation (WHO) declared COVID-19 as pandemic on 11th March 2020 and considered as world biggest crisis of recent history. This pandemic has affected more than 120 countries in initial four months and infected more than million people. COVID-19 is caused primarily due to Novel Corona virus which is a new strain and it was not previously found in humans. Major symptoms which were detected in initial stages were fever and cough, respiratory problems and further can lead to pneumonia and death. But as the time passed and in later stages, its nature started to vary and so that its symptoms and various was detected even without any basic symptoms. It spread through the droplets from sneezes and by direct or indirect contact with infected person like as SARS. The first case of COVID-19 was detected and reported Hubei Province of China on 17th Nov 2019. As the world has changed and transformed in to Globalised world, therefore, international travel has taken the infection around the globe.

Indian Context

Being India as part of the one of the oldest civilisations, Covid-19 is not the first case of pandemic and also it will most certainly not be the last either. Increasing globalisation and rapid urbanisation of the world, the risk of such outbreaks is only becoming higher as it is spreading quickly to all parts of the world. In the critical situation of COVID-19 health system has already strained worldwide. Rapid increase in demand of health facilities and health care professionals as well as front line workers threatened to leave some health system overstretched and unable to operate efficiently and effectively. When the Ebola outbreak occurred in 2014-15, the increased number of casualties caused by measles,

malaria, HIV/AIDS and tuberculosis was also attributed to failure of health system which subsequently exceeded deaths from Ebola. Before COVID-19 outbreak 1.6mn positive cases were infected by this virus which was greater than other pandemic in recent times, but COVID-19 has already surpassed that. Though the case fatality ratio was initial lower than SARS (2003) but in later period it has increased drastically and greater spread resulted the highest death toll in recent history. It has raised alarm and caused serious concern over the existing health infrastructure and health system.

India's lower spending i.e. 1.28% of country's GDP (2017-18) on health sector made its condition more vulnerable to this pandemic. India's overall health spending is 3.6% of GDP, which is lowest compared with neighbouring and developed countries. Out of this, government spending on health accounts hardly even 1%, It is quite unsurprising that the out-of-pocket health expenditure for households is extraordinarily high in India and about 65% of all health expenditure in India (nearly 2.5% of GDP) is borne privately by households. According to recent data on expenditure on health by various countries published by WHO, current India's spending is very much lesser in comparison with developed countries such as USA (18%), Japan (10.9%), South Korea (8.1%) and developing countries i.e. Brazil (7.5%) and even neighbouring countries like Bangladesh (2.2%) and Bhutan (3.6%), Indonesia (1.4 %) and Sri Lanka (1.68 %). India is also lacking universal health coverage, According to Global health experts, looking at this paltry health expenditure, India does not have adequate infrastructure or financial commitment to tackle such large health disaster. In another words it can be said as if wrong public health strategy is one reason for vulnerability, then the lack of resources is another. Therefore, it is quite evident that there is acute shortage of medical and health care professionals and supplies throughout the country. Currently, the patient doctor ratio is 11082:1, which is more than 10 times of WHO mandatory requirement, even in rural areas situation is very critical where doctor patient ratio is 1: 10926 (National Health Profile 2019). Organization for Economic Co-operation and Development (OECD) reports further revealed another concern, i.e. in India there is 0.53 beds available on 1000 people which is even lower than Bangladesh (0.87), Chile (1.1), Mexico (1.38), Indonesia (2.11), Turkey (2.73), China (4.34) and Russia (8.05). While examining the health infrastructure Centre for Disease Dynamics, Economics & Policy (India) and Princeton University has reported in its report that the country has 713,986 beds, including 35,699 in intensive care units, and 17,850 ventilators for a large population of 1.3 billion people. In India, there is a major shortage in the availability of beds in the hospitals. Bihar (one of the least-developed states) has 0.12 beds per thousand people, which is the state with the fewest beds per person. The poorest state of India, Odisha, according to Raghuram Rajan commission, has 0.38 beds per thousand people. In the Northeastern part of India, Assam and Manipur has 0.32 and 0.48 beds, respectively, which is below the national average of 1.13 beds per thousands of people. Other states of the Northeast and Southern India have better capacity to serve patients – near to or above the national average. The states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, where one in every four persons is below the poverty line, have less capacity than the national average and more than half of India's population lives in these four states.

Global Health Security Index (2019) which measures pandemic preparedness for countries based on their ability to handle the health crisis ranked India 57th and lower than the USA which stood first followed by UK 2nd, Brazil 22nd and Italy 31st and also suggested that it is more vulnerable to the pandemic than other countries that have seen a high number of fatalities so far. According to the

National Health Profile 2019, in India over 50% of all deaths due to communicable diseases in 2018 were due to respiratory diseases and pneumonia, symptoms common with those of COVID-19. The low priority accorded to health has translated into limited investments in both health infrastructure and health data. In this backdrop, it is emergent need of the situation to build a resilient public health system that can combat efficiently such pandemics in future, prevent epidemics and diseases, promote good health and hygiene and respond quickly to minimise the lives of human when these outbreaks of that great magnitude happen.

Present Health Infrastructure

India's health care system has evolved by default rather than design. It is primarily because the Indian government has incentivized the private sector over the public health system over the past few decades. Indian Health system is a mixed health-care system consisting of public and private health-care service providers. While, majority of the private sector health care facilities are concentrated in urban locality and providing secondary and tertiary health-care services. In rural areas, public health care infrastructure is three-tier system based on the population i.e. Sub Centre, PHCs, Community Health Centres, First Referral Units. Sub-Centre (SC) is established in plain area (of 5000 Population) and in terrain and tribal area (of 3000). It functions as most peripheral and first contact point between PHC and community. It is equipped with 1-2 auxiliary nurse midwife ANM and one male health worker. These centres basically transmit the information related to behavioural change and also provide services in related to maternal and child health, family welfare, nutrition, immunization, diarrhoea control and control of communicable diseases programs. Primary health centre (PHC) is established with large population of 20,000-30,000 and works as the first contact point between the village community and the medical officer. It is equipped with 1 Medical officer, 14 paramedical including 2 staff nurses. It acts as a referral unit for 5-6 SCs and having 4-6 beds for in-patients. It also provides integrated curative and preventive health care to the rural population with emphasis on the preventive and promotive aspects of health care. Community health centres (CHCs) established with population of 80,000 - 1,20,000 and equipped with 4 medical Specialists surgeon, physician, gynaecologist/obstetrician and paediatrician supported by 21 paramedical and other staffs. It serves as a referral centre for PHCs within the block It has 30 beds with an operation theatre, X-ray, labour room and laboratory facilities. First referral units (FRU) is generally an existing facility and any district hospital, sub-divisional hospital, CHC) can be declared as a fully operational FRU having facility to provide round-the-clock services for emergency obstetric and new-born care, additionally all emergencies required. Critical determining factor which decides to be FRU are emergency obstetric care including caesarean& surgical sections, care for infant child and blood storage facility (24X7).

Strengthening Health System measures taken by Government

NHM (National Health Mission), one of major initiative of Govt of India with an articulation of the commitment to raise spending on public health from 0.9% to 2.3% of GDP launched in 2005 aimed to focus on reduce maternal and child mortality and promoting equity, decentralization and community participation in operationalization of health-care facilities. It has two sub missions NRHM (National Rural health Mission) and NUHM (National urban health Mission). Under NRHM, High-focused and low-focused states and districts based on the status of infant and maternal mortality rates, and concerned states were provided additional support, both financially and technically under the mission.

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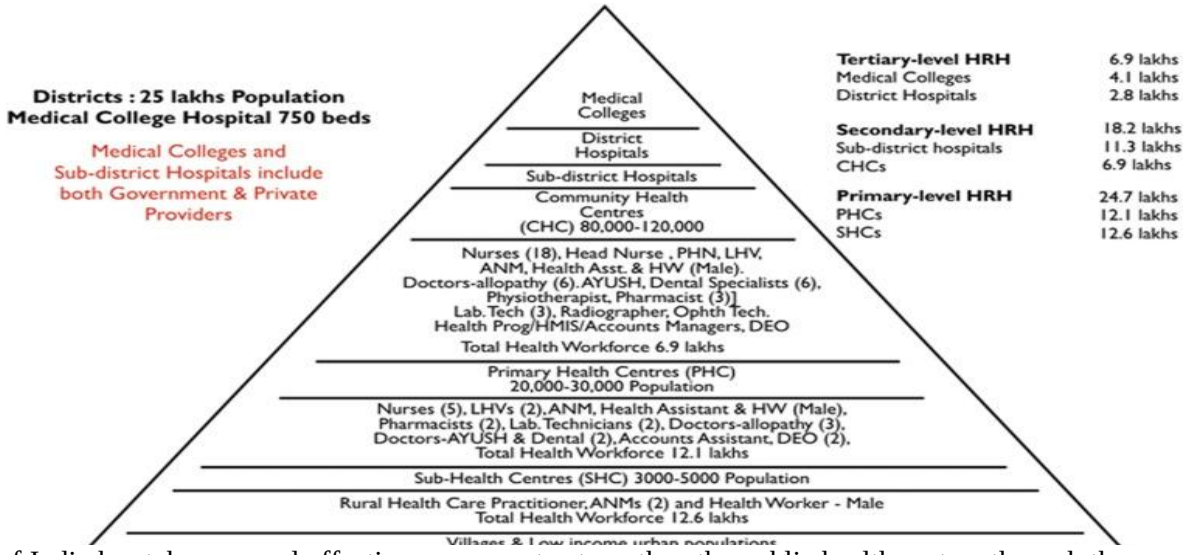
Gradually it has emerged as a major financing and health sector reform strategy to strengthen the state health systems. Major initiatives were undertaken under NRHM for architectural correction of the rural health system in terms of health care staff availability, program management, physical infrastructure, community participation, financing health care and usage of ICT. The mission emphasized on increasing health-care delivery points as well as facilities available at the health-care delivery points. It not only focused on increasing the number of health care staffs such as physicians, specialists, staff nurses, as well as ANMs, but also gave importance to increasing the production capacity of medical colleges at graduate and post graduate levels. Physical infrastructures were enhanced by creating more health centres, infant care units and also renovating existing centres, which increased the capacity of health systems. Special efforts were taken for strengthening community participation through the formation of health committees at the village level and patient welfare committees at PHC level. Extensive usage of ICT made easier to track the delivered services to mother and child. This all remarkable effort has been an outcome of increased financial assistance by the central government and increased rates of utilization and the total investment on health care system and facilities by the central government equalled nearly $ 17 billion during the period of 2005-2013. As per NRHM Statistics (National Rural Health Mission) in India, 722 district hospitals, 4833 CHCs, 24,049 PHCs and 148 366 SCs are operational and providing health care services. Below mentioned picture clearly depicts the health-care infrastructure and required resources at each level as per Indian Public Health Standard (IPHS).



Govt. of India has taken several effective measures to strengthen the public health system through the implementation of flagship programmes like Mission Indradhanush, and the National AYUSH Mission, POSHAN Abhiyaan, and Swachh Bharat Mission also impact human health as they help prevent diseases, and boost immunity apart from NHM (NRHM & NUHM) in recent years. Central Govt has also introduced Ayushman Card schemes to provide advance health care facilities at nominal charges. Therefore, it must be understood that a strong health care system along with strengthening the primary healthcare structure will not always prevent pandemics or epidemics from occurring, but it will also help to manage them more effectively, limiting their socio-economic toll and minimises the losses of human lives. In the light of COVID though Govt of India took effective measures to control through its complete lockdown and combined effort of central and state govt but lack of resources and poor infrastructure made situation more vulnerable. India's response to the COVID-19 pandemic is one of the most stringent in the world and scored a perfect 100 among 73

countries. on the Oxford COVID-19 Government Response Tracker (OxCGRT) that aims to track and compare government responses to the coronavirus outbreak worldwide, rigorously and consistently. South Africa, Israel, New Zealand and Mauritius are other countries that scored a 100 in this tracker.

Literature Review

Literature review is an important part of this paper, the various contemporary and related articles, journals and literature were reviewed which were highlighted the importance of Indian health care system and developments in the literary purview on the similar subject. by critically examining the effectives measures taken by Govt. and what could be done more to enhance its efficiency. The literature survey on changing health system and delivery of health care services reveals that there is complete revamp in the system and supply chain to make it dynamic in nature in its all aspects to cater the need of large population. Thereview of literature has been arranged in a very systematic order so that it can help to understand the condition of health system, health care services and successive development and measures taken by government to improve and the further measures to enhance the efficiency to strengthen the system to make it robust so that it could fulfil the needs of the people.

Johnson. & Johnson (2001) explained mapping of Public Health Resources, specific diseases and other health events in relation to their surrounding environment and existing health and social infrastructure, and such Information when mapped together can create a powerful tool for monitoring and management of epidemics in the paper "GIS- A tool for monitoring and management of Epidemics". Usage of GIS allows interactive queries of information contained within the map, table or graph permits a dynamic map published on the internet assist patients in automatically reflected on the maps. GIS procure aerial/satellite images to allow information like temperature, soil types and land use to be easily integrated, and spatial correlations between potential risk factors and the occurrence of diseases to be determined. This paper further explained that the usage of of advance GIS tools can provide the health care researchers and planners to visualize and conceptualize the health plans and policy effectively that can be contemporary and as per aspiration of the country needs.

Bodavala (2002) in his paper "ICT applications in Public Health Care System in India: A Review" highlighted the ICT implication in Indian health care system and advocated the revamp of system as it is facing critical shortage of health care professional, inadequate facilities at urban and rural area. Lack of proper referral services which caused the lack of confidence in the health system. Despite the measures taken by successive governments, it shown only marginal success, therefore, he strongly emphasised that application of ICT tools to improve access and delivery of healthcare services to catering the needs of people living in rural areas.Rychetnik, et al (2002) in his research paper "Criteria for Evaluating Evidence on Public Health Interventions" found that public health interventions tend to be complex, programmatic, and context dependent. The evidence for their effectiveness must be sufficiently comprehensive to encompass that complexity.Narayana (2003) published an article "Changing Health Care System" in that he highlighted the measures taken by Andhra Pradesh state govt to improve the financial viability and quality of health care in public hospitals and raised concern on the stagnation in the size and decline in the quality of public health care.Yadavendu (2003) in his paper focussed on the overriding influence of methodological individualism in the historical

construction of public health. This paper also highlighted that systematic epidemiological studies in the 19th century rightly justified epidemiology's claim as the basic 'science' of public health. But, the gradual progression away from the population perspective towards risk factor, clinical and finally molecular epidemiology, bears evidence of the increasing influence of individualism in public health.Deogaonkar (2004)has studied the "Socio-economic Inequality and its effect on Healthcare inequality in Indian population and its effect on the healthcare system. He tried to identify the factors responsible for the difficulties in healthcare delivery in an unequal society and its effect on the health of a society.Abhijit Banerjee, et al (2004) has highlighted in his paper which was based on health condition of rural areas of Rajasthan and found that the public health service is in very bad shape and that low quality of public facilities has also had an adverse influence on the people's health. Das Gupta and Rani (2004) in her article "India's Public Health System How Well Does It Function at the National Level?" found that India has relatively poor health outcomes, despite well-developed administrative system, adequate technical resources in various field, and an extensive network of public health institutions for research, training, and diagnostics. This paper used the instruments i.e. framework of the Essential Public Health Functions that was identified as the basic functions and requirements for an effective public health system to assess the performance of public health systems in the USA and other advanced countries. This paper further revealed that the strengths of the system lie in having the capacity to carry out most of the public health functions and weaknesses lie in three broad areas i.e., public health regulations and their enforcement, deep management flaws that hinders effective and optimal use of resources, including inadequate focus on evaluation; on assessing quality of services; on dissemination and use of information; and on openness to learning and innovation. Amrith (2009) in the paper "Health in India since Independence "suggested that history is essential to understand the contemporary challenges in Indian Health Policy. This paper focussed that how colonial period under investment and poor health infrastructure continued to shape the health policy after independence. The paper highlighted that a top-down, statist approach to public health was not the only option available to India in the 1940s, and that there was a powerful legacy of civic involvement and voluntary activity in the field of public health. It further shown the insights intellectual history and heritage may bring the understanding of deeply rooted features of public health in India, which continues to characterise the situation confronting public health policymakers. Dasgupta, et al (2010) described in the paper "How Might India's Public Health Systems Be Strengthened? Lessons from Tamil Nadu" that the central govt policies have inadvertently did not much emphasis on environmental health and other preventive health care services in India since independence. Diseases causing due to unhygienic and insanitary conditions impose high costs even among the more affluent and rapid urbanisation also increased the potential for disease spread. Furthermore, this paper also analysed that Central Government's policies and then described Tamil Nadu's public health system, which offers basic principles for strengthening public health within the administrative and fiscal resources available to most states.Prinja, et al (2012) revealed in his paper "Health Care Inequities in North India: Role of Public Sector in Universalizing Health Care" that the income inequality in India is associated with poor health and these inequities exist in service utilization and financing for health care. Higher health cost is pushing large number of households in to poverty. The authors undertook this study to ascertain inequalities in health status, service utilisation and out of pocket (OOP) health expenditure in two northern states i.e. Punjab, Haryana and UT of Chandigarh. This paper revealed that public sector hospitalisation had a pro-poor distribution in all these states and analysis indicated that there must be major improvement in public health service

delivery. OOP health care expenditures in public health care institutions should be curtailed to improve utilisation of the poorer section of population. Furthermore, this paper also suggested that the greater availability of medicines in public sector and regulation of their prices provide a unique opportunity to reduce public sector OOP expenditure.Sinha (2012) has revealed that the quality of implementation of the National Rural Health Mission in a number of states has transformed the public healthcare system considerably in his paper "Health Evidence from the States". He also highlighted that there is great learning from these improvements as these are focussed on the grass roots and found that local recruitment is the best way to forge a credible public health system that has public accountability.Joice (2013) in his study "A Study on Workforce Challenge in Healthcare Industry: An Imperative Factor" to find out the challenging tasks of attracting, recruiting, training and retaining in this sector and the possible ways to move ahead for better accomplishment. In this study he found that Healthcare sector is preferred, by looking at the rate of the growth in India which is moving ahead and is neck to neck with the pharmaceutical, software, construction industry of the country. Amidst this, healthcare sector faces innumerable challenging factors of talent management, training, workforce planning, recruitment and retention, which must be addressed and needs urgent attention.Qadeer(2013) in the paper "Universal Health Care in India: Panacea for Whom" examined the current notion of universal health care (UHC) in key legal and policy documents and argued that the recommendations for UHC in these entail further abdication of the State's responsibility in health care with the emphasis shifting from public provisioning of services to merely ensuring universal access to services. This paper also revealed that current UHC strategy in equity is using tool for promoting the private sector in medical care rather than health for all.Muniraju (2013) in his paper "Health Care Services in India: An Overview" has highlighted the provisions of National Health policy and Indian healthcare features a universal health care system run by the central and state governments and the constitution charges every state with rising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties.

Saisha and Manunath (2018) in their research paper suggested that the one of the major characteristics of India is higher growth in population and it is the prime responsibility of the government to provide effective and efficient healthcare services to all. Though it is quite difficult to provide health care services at free of cost due to the heavier cost involved in procurement of sophisticated and advanced infrastructure and to maintain quality healthcare services. These factors compelled the Government to invite private sector participation and investment but there must be equity and cost affordability of the people must be kept in mind.

Findings and Recommendations

India was one of few countries which was very quick in responding against this outbreak. In the initial spread Indian Government took a bold step of lock down which caused economy on ventilator but it found to be an effective measure to limiting the spread seeing the higher population density of the country. India's healthcare infrastructure is incapable of dealing with this larger outbreak in current capacity is facing acute shortage of testing kits, personal protective equipment (PPE), drugs, and adequate health infrastructure, such as hospitals, with necessary treatment facilities Additional beds, ventilatorsand quarantine facilities, Shortages in medical supplies and an inability to provide adequate testing are the major difficulties which are faced by country.Central Government fund of Rs 15,000 crore for building infrastructure to fight against this pandemic would be greater relief. But this is not the end of the way, India has to increase it health expenditure drastically from 1.3% to 2.5-3%

minimum to meet its requirement and health care needs. In Initial months due to lack of resources and lab facilities, testing of cases were very low and even 10,000 in a day nationwide, which increased due to coordinated effort of central and states and it gone up sharp and by end of June 2020 every state was testing more than 10,000 cases in a day. The detection, isolation and management of coronavirus infected people largely dependent on hospitals. In India, to test for the coronavirus, people either come to laboratories located in tertiary hospitals or they visit district hospitals, where samples are collected and transported to the laboratory. In both cases, the person has to travel large distances, and risks exposure to infection during transit and in the hospital barring some exceptions i.e., some accredited private hospitals are collecting the samples at households with charging some fees. Even for isolation, majority of States are relying on specially designated areas or wards within tertiary hospitals, or creating new large hospitals or isolation centres. It increased the higher risk and increased risk of infection and put greater strain on public health system.is another major concern. Western healthcare systems have been built around the concept of patient-centred care, but an epidemic requires a change of perspective toward a concept of community-focussed care along with promotion of safe community practice and to ensure better hygiene practices and community behaviour changes. These long cycles of focus on hygiene combined with Swachh Bharat Abhiyan may have positive impact on improved health of the society, although extent of benefit will be difficult to measure tangibly. On the flip-side, in the short-term, a tremendous increase in burden on primary care facilities and GPs can also be anticipated as over-cautious people throng them even on mild symptoms. There should be major emphasis on strengthening the PHCs rather than hospitals which is the backbone of the health system.

India has an extensive network of public health care institutions i.e., about 25,000 primary health centres and 5,300 community health centres spread across all regions and States. In addition to this there are large numbers of private and non-governmental organisations also provide primary healthcare in urban and rural areas. In this juncture and adverse situation, they can play a critical role in managing the epidemic and providing continuity of services at affordable rate. So, private health care service provider must join hands with public institution and must work in sync. An investment in strengthening primary healthcare at these times will also go a long way in rejuvenating and creating resilient health system

India has to evolve as data driven healthcare system and all the health care facilities must be aligned under one system in the form of the government's Health Management Information Systems (HMIS) that will accelerate policy and operational decision as well as measuring the extent of grieve of health related such large outbreaks in future. we fall short on data-driven decision-making. There is also need to fast track health sector reforms such as pending reforms in areas of medical supplies, health financing, and payment mechanisms, Standardisation of Medical Education Bills etc, these need urgent attention.

Reforms will boost this sector and there is good example of guidelines for telemedicine or the remote delivery of medical services that were issued by the government in March 2020 which helped a lot in this situation. It enabled doctors to diagnose and treat more patients, reduced the load on health facilities, while also reduced the risk of transmission of the virus. Apart from this, it is also needed training to front line health care forces such as ANM/Paramedical staffs/Nurses. During this pandemic Niti Aayog took initiative in this regard frequent online training sessions for nurses, paramedic staff and primary health workers for protocol to be followed for detection, isolation and communication

regarding suspected infections is being organised. Additionally, increased use of technology and opening up telemedicine will improve access to healthcare even in remote locations in geographically diverse country like India. India has emerged as the pharma hub of the world over last few decades and being the largest supplier of generic medicines all over the world with the significant share of 20% in global supply by volume and 50% of global demand for vaccines. At present 80% of antiretroviral drugs used to combat AIDS are supplied by Indian firms, which is a significant contribution to mankind and great support to afford these medicines by least developed countries. During COVID-19 Indian export of hydroxychloroquine saved million lives all across the globe.Despite being the strongest player in pharma, a major lacuna that developed over years in the Indian industry is over-reliance on Chinese APIs (bulk drugs) especially the fermentation-based products. This can be a great opportunity for India to internalise the entire supply chain for our own good as well as present ourselves as an end-to-end giant in the pharma supply chain and a strong pharma industry has always been a pillar of affordable healthcare in India.Another area where India and almost the entire world is over-reliant on China is medical equipment such as ventilators, PPE, masks, diagnostic where India can take advantage and internalise its resources and make indigenous lows cost quality products.

Conclusion

The creation of a well-balanced health system is not only the objective of this pandemic response, but also creating a sustainable health system which can cater the universal health coverage and can be best defence against such larger outbreaks. It is also seen that weak health systems, which do not function well in a steady state, cannot suddenly generate surge capacity when challenged by a public health emergency. Therefore, it is needed is adequate investment in creating a health system that can withstand any kind of public health emergencies, deliver universal health coverage and other targets of the Sustainable Development Goals, while creating mutually beneficial synergies between health and the economy It is significant and positive change health has never been on prime agenda in public expenditure with mere spending of 1.28% of GDP, but its positive that now central and state governments have collectively focussed on responding this pandemic and pledges for strengthening the health system. Despite India's overstretched public health system, country succeeded in defeating Polio and managed very effectively the recent outbreak of Nipah virus which caused death of 17 human lives in Kerala. In Similar manner COVID-19 could be confronted, but for that both the Government has to adopt a grassroot strategy and working in coordinated manner. Meaningful community engagement is needed where Government, health experts will have to treat local people as major stakeholder who can play greater role in information sharing, influencing behavioural changes and creating awareness. Henceforth, there is an urgent need to ramp up the public health system and strengthening the district hospitals, medical college hospitals, and primary health care infrastructure. Without strong and effective public sector health care services, country will face several difficulties to deliver universal health coverage and unable to combat epidemics with the degree of effectiveness and equity that is required.

Therefore, it is quite evident that COVID-19 has firmly established the need for active action and the establishment of a robust, collaborative, scalable, and agile digital and physical healthcare infrastructure."If India will reform own public health system now, it creates an opportunity for ripple effects in other areas too."

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