# Strengthening public healthcare systems in India; Learning lessons in COVID-19 pandemic

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## Abstract

COVID-19 pandemic has involved nations and incapacitated the health systems globally. The pandemic preparedness has been tested with immense losses. Universal health coverage is needed more than ever to recuperate from the effects of the current pandemic. Post pandemic, many lessons need to be learnt especially for developing economies like India where public healthcare system is grossly inadequate to take care of health needs of citizens. World Health Organization's framework of six health system building blocks was utilized to study the lessons learnt and actionable points in the post pandemic period. Participation in Global Health Security Alliance has to be stepped up with involvement in Joint external evaluation and development of epidemiological core capacities. National Health Security Action Plan needs to drafted and available for health emergences. Ayushman Bharat scheme should incorporate elements to address surge capacity at the time of health emergencies and measures to deliver care at the time of pandemic. Technology through telemedicine, m-health, and digital platforms or apps should contribute to trainings, supervision, and facilitation of healthcare delivery at remote locations. Open data sharing policies should be developed for the practice of evidence-based public health. Public healthcare system and health manpower trained in epidemiology should be given a boost to have system readiness to respond in case of future pandemics.

**Keywords:** COVID 19, India, lessons

COVID-19 pandemic globally has emphasized the need for strengthening public health care systems. Earlier in 2016, Ebola outbreak raised concerns about the poor preparedness of health systems globally.[1,2] System strengthening is essential as trial times that are visible during pandemics and epidemics leave no time for preparedness. Universal Health Coverage (UHC) is to ensure that everyone, everywhere, should have access to essential healthcare services without facing financial hardship. Progressive realization of UHC is also one of the key features of the United Nations' Sustainable Development Goal. UHC assumes more importance during health emergencies and requires preparedness beyond the routine healthcare delivery mechanisms.

UHC, in its existing form, has the potential to improve global health security through various mechanisms, Stronger and resilient healthcare systems, financial security, economic support to poor at the time of crisis. Systematic coordination between UHC and global health security with shared objective of creating resilient health systems is expected.[3] The health

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system encompasses all the organizations public or private, institutions and resources that are devoted to producing health actions whose primary intent is to improve health. Kruk *et al*.[4] describe a resilient health system as one that is "integrated with existing efforts to strengthen health systems," able to "detect and interpret local warning signs and quickly call for support," able to provide care for a diverse population, able to "isolate threats and maintain core functions," and is able to "adapt to health shocks."

With many countries now implementing plans to achieve UHC, and the increasing threat of emerging pathogens[4] as well as antimicrobial resistance,[2] it is essential to highlight the vital role public health services have in discussions around UHC. It is essential to understand mechanisms to address global health security and health system strengthening together for creating robust health system responses at the local, national, regional, and global levels. Promotion of health security entails that effective health systems exist before a crisis, are sustained during and after conflict and disaster, and are at all times accessible to the population.[5]

The fate of COVID-19 pandemic in countries with well-established health systems emphasize on the need of strong public health services that go beyond hospitals and health establishments. Governments looking to develop sustainable capacity to respond to rapidly spreading epidemics must recognize overlooked public health services as vital, and adequately finance them as part of the UHC model.[6] The current paper attempts to highlight the key concerns in public healthcare system of India and areas that need prioritization for action learning lessons from the current pandemic. The paper has been analyzed based on the framework of six health system building blocks as proposed by World Health Organization; Leadership/Governance, Health information System, Service Delivery, Financing, Health Workforce and Access to Essential Medicines.[7]

## Leadership/Governance

World Health Organization has emphasized on the importance of national health planning and monitoring as critical for improved health systems governance. National protocols and SOPs are required for immediate action. India fairs poor in the Global Health security index ranking with 57th position compared to other countries and a cumulative score of 46.5 and is placed in the middle (more prepared) category.[3] Global Health Security Agenda and timely implementation of its objectives has received political commitment. Collaborations on infectious diseases and Global Health Security Agenda (GHSA) are there with recent establishment of the GHSA Cell within the Ministry of Health and Family Welfare, India in 2017. Disasters follow the protocols of National Disaster Management Authority under Ministry of Home Affairs. Among infectious disease outbreaks, influenza is identified as the most common disease capable of causing large scale outbreaks. A national action Plan for Pandemic Preparedness and Response was prepared by MoHFW, GoI, and published in June 2009 by the Directorate General of Health

Services (DGHS).[8] India's Global Health Security agencies; Stakeholders Come Together for First Inter-Agency Roadmap Meeting was held in 2018. India is regularly submitting the annual self- assessment plan, however is not participating in the joint external evaluations. More of such national protocols and governance documents need to be made for supporting immediate action during emergencies.

COVID-19 pandemic in India led to enforcement of many acts and laws to address governance issues and democratic and fundamental rights of citizens were restricted with the promulgation of these acts, for example, Epidemic Diseases Act, Disaster Management Act, Essential Commodities Act, Healthcare Establishment Act, etc., It needs to be understood that many of such acts have their own inherent flaws and need to be modified for the current context.[9]

## Health Service Delivery & Financing

The healthcare model in India was designed to provide a standardized package of basic health services as primary care to the population (prioritizing women's and children's health) with an effort to provide for equitable access through targeted services to underserved areas. Ayushman Bharat under National Health Policy 2017 has focused on two critical elements: Health and Wellness Centres and National Health Protection Scheme. Health and Wellness Centres are envisioned as a foundation of the health system to provide comprehensive primary care, free essential drugs and diagnostic services, whereas National Health Protection Scheme is envisaged to provide financial risk protection to poor and vulnerable families arising out of secondary and tertiary care hospitalization.[10] These two together can play a critical role in national health security. Well-equipped and staffed Health and Wellness centers can contribute to close surveillance of outbreak in catchment area and aid response measures. These can function as independent fever clinics for screening, referral and testing for COVID-19. Treatment facility for the same can be made available at the secondary or tertiary level of care with a dedicated contingency plan ready in case of outbreaks. There should be a dedicated space for isolation wards to manage outbreaks of infectious diseases. Protocols and SOPs must be available in case of outbreaks and financial mechanisms must be in place to make funds available to the health centers for immediate action during the outbreak. National Health protection Scheme should ensure financial protection for people seeking treatment at the time of outbreaks and disasters.

The Indian government's expenditure on health as a percentage of GDP still hovers around 1·5%, one of the lowest in the world. Under-investment in public healthcare system poses a challenge to India's COVID-19 containment plans. Nearly, 52% of households in urban areas, and 44% of households in rural areas have private sector as the main source of healthcare when they are sick. At the times of pandemic, catastrophic expenditures rise because of high cost of health care by private healthcare system which is unregulated by the government.[11]

COVID-19 pandemic has led to disruption of routine healthcare services in the country, with closure of routine outpatient departments, immunization clinics, and antenatal services. As health systems are overwhelmed, both direct mortality from an outbreak and indirect mortality from vaccine-preventable and treatable conditions increase dramatically. Analyses from the 2014–2015 Ebola outbreak suggested that the increased number of deaths by measles, malaria, HIV/AIDS, and tuberculosis attributable to health system failures, exceeded deaths from Ebola.[2,12] It is also necessary to have specific list of essential services which need to be delivered and create a roadmap for progressive phased reduction.[13] Triggers/thresholds must be established for phased reallocation of routine comprehensive service capacity toward essential services.

India's surveillance data shows recurring outbreaks of gastrointestinal disorders, hemorrhagic dengue fever, as well as large scale outbreaks of malaria point toward insufficiency in the efforts to improve environmental health and sanitation.[14] Current Pandemic of COVID-19 has shown the inability of health establishments to cater to infection prevention control guidelines at work place because of architecture and design of the establishment. Public health is an interdisciplinary field and engineering can solve public health challenges of Water, Sanitation and hygiene (WaSH), air water and noise pollution and other environmental health issues including vector control. Public health engineering is also essential at times of epidemics, wars, and disasters where accommodating displaced people further challenges the health of masses. Design and creation of public facilities that ensure the health and well-being of inhabitants maintaining the standards of ventilation, lighting are essential. Health facilities need to be constructed adhering to public health norms.

## Health Management Information System

Data is essential for any public health program and needed for evidence-based decision making. Integrated disease surveillance program has been the backbone of surveillance system for infectious diseases in India. The decentralized surveillance mechanism attempts to conduct indicator and event based surveillance for immediate public health response.[15] The system needs to be further strengthened with capacity building of staff prioritized. Syndromic and presumptive surveillance by healthcare workers need to be strengthened by continuous capacity building, training and supervision. Laboratory networks must be expanded with basic testing facility available at all peripheral health centers/health and wellness centers of the country. Public health laws must ensure active participation of private health sector in disease surveillance mechanism.

The country's public healthcare system need to be abreast with advancements in technology and their applicability for health of the citizens. Local and State public health agencies need data on the current health status of the people in their communities and guidance from public health experts. To improve access to information resources, state-of-the-art technologies must be deployed to create integrated information and communication systems linking all components of the public health system (Medical colleges, local public health structures, and private healthcare establishments). More so during pandemics such framework of data sharing will facilitate timely guidance by experts and prompt action by health establishments. It is only when such systems are existing that they can be deployed at the time of emergencies.

The process of data transfer will be facilitated from digitization in the form of Electronic Health Records. National digital health blueprint talks about creation of district-level electronic databases, establishing registries for diseases of public importance, Federated National Health Information Architecture and roll-out and link systems consistent with Metadata and Data Standards (MDDS) & Electronic Health Record (EHR).[16]

As big data continues to develop, epidemiologic and health outcomes data will grow exponentially. Information advances will have implications for health workforce policy with data programmers, analysts, and data scientists being recognized as essential members of healthcare and public health teams.

Technology through telemedicine, m-health and digital platforms or apps can contribute to trainings, supervision and facilitate health care delivery at remote locations. Telemedicine is the use of electronic information to communicate technologies to provide and support healthcare when distance separates the participants. Telemedicine has been utilized in interactive health communication and disease prevention, disease surveillance and disaster management besides being an essential aid in delivering virtual health services.[17,18] It is particularly well suited to address the challenges presented by COVID-19, as it allows more providers to screen and treat a greater number of patients, and patients who may be infected with the virus no longer have to travel to the hospital or the provider's office for evaluation. Recently, Board of Governors issued Telemedicine Practice Guidelines in midst of the COVID Pandemic to avoid movement of people and crowding of healthcare establishments.[19]

## Essential Medicines

COVID-19 outbreak focused on flattening the curve to ensure that surge capacity during an outbreak does not overwhelm the healthcare system. It is essential that to save lives prompt actions are taken during outbreaks and readiness of mechanisms and lines of action well before hand will facilitate the same.

During an epidemic, having essential medicines readily available for distribution is critical to efficient management of surge capacity and to maintain continuity of essential services. The need for medicines and protective equipment will depend on the nature of emergency and the risks it poses. The system should have protocols for management of donated medicines and equipments received from local, national, or even international sources. Protocols to

ensure that smooth exchange of information and cooperation happens between hospitals, regional entities, and health authorities for maintenance of supply chain on demand basis.[13]

An overall Hospital Emergency Response Plan (including an Epidemic Sub-plan), along with an Incident Command Group to coordinate the hospital's overall emergency response, should be available. SOPs should be in place detailing on the supply chain for acquiring, stocking, and distributing the necessary supplies in the quantities required before and during an emergency and ensure that these procedures are consistent with national policies and national emergency response plans. Memoranda of Understanding or Mutual Aid Agreements with suppliers and shippers, local community pharmacies, and other healthcare facilities within the local or regional hospital network, in order to ensure the supply and resupply, of sufficient quantities of essential pharmaceutical materials must be available. Protocols should also be available for other essential services such as laboratory, food, water, and electricity supply. If the outbreak is of infectious disease then designated facilities should be listed for quarantine and isolation of patients.[20]

## Health Workforce

A specialized workforce in epidemiology is needed, with the capacity to generate evidence and apply the analysis of that evidence to immediately solve public health problems. The *National Health Policy 2017* built on this theme explicitly proposes creation of a public health management cadre in all states.[21] Moreover, there is a need that knowledge base of public health workers be supplemented through on-the-job training and continuing education programs. The multidisciplinary public health team needs expertise from all specialties contributing to health of masses, not restricting only to those with medical knowledge. Special need arises to have expertise on epidemiology, environment, demography, statistics, entomology among many others. The "public health professionals" constitute the specialist public health workforce which could be defined as a workforce comprising people who have higher qualifications in public health and who occupy positions exclusively or substantially focused on population health.[22]

The training of epidemiology is currently provided as a part of community medicine training to undergraduates in MBBS curriculum. Basic knowledge of public healthcare system of the country, epidemiology, programs available for improving health of community, etc., are given to an undergraduate. This is essential to make him a competent primary care physician. Postgraduation is offered as Master's Degree (MD) in Community Medicine with training in epidemiology, disease surveillance, health systems, health programs, and public health laws. Master students are trained additionally on research on public health problems of the country. They are skilled public health professionals and trained doctors to take up leadership roles in public healthcare systems outside medical colleges.

Few medical colleges also offer PhD in Community Medicine/ Preventive and Social Medicine. In addition to these traditional programs, some of the medical colleges/institutions run following specialized courses for medical graduates with limited annual intake capacity: MD (Community Health Administration), MD (Hospital Administration), Masters in Hospital Administration (MHA), MD (Tropical Medicine), MD (Maternity and Child Health), and PhD (Hospital Administration), Diploma in Hospital Administration (DHA), Diploma in Health Administration (DHA), Diploma in Health Education (DHE), and Diploma in Industrial Health (DIH).[23,24]

Master's in Public health has grown as a discipline recently in India to overcome the shortage of public health professionals in the country. Between 1997 and 2016–2017, the number of institutions offering MPH programs increased from 2 to 44. The eligibility criteria for the MPH programs are variable with no formal body or council regulating the same. In the 2016–2017 academic year, 1,190 places were being offered on MPH programs. These are one or two year programs, training student on Health Economics, Environmental health, Epidemiology and Statistics, Health Programs, Health Promotion identified as major areas of Public Health.[24]

To augment the availability of skilled epidemiologists at the national, state, and local levels, the government launched in 2012 the India Epidemic Intelligence Service (EIS) training program. This program is being implemented by the National Centre for Disease Control (NCDC), Delhi, in close collaboration with the US Centers for Disease Control and Prevention (CDC), Atlanta. It is now expanded to two additional hubs - the WHO India Country Office and ICMR's National Institute of Epidemiology, at Chennai. The EIS training program is a competency-based, specialized yet practical training in epidemiology, emphasizing on *significant* and *consequential* epidemiology.[25] At present, 45 EIS officers (32 alumni and 13 currently in the programme) are supporting various States in this pandemic containment exercise, including Kerala, Maharashtra, Nagaland, and Uttar Pradesh.[26]

Public health engineering is another specialty of concern. The training is available as pre-service programs through institutes of civil engineering and in-service training through Government of India recognized engineering and public health training institutes. There is need for developing teaching and training of public health engineering or environmental engineering as an interdisciplinary subject. Public health institutes can play an important and significant role in this regard by engaging in initiating specialized programs in this domain.

It is evident that to strengthen universal health coverage, shortage and inequity of health workforce at all levels of health care delivery need to be addressed on priority basis. In India, the density of doctors, nurses, and midwives per 10,000 population is 20.6 according to the NSS and 26.7 based on the registry data. This is less than WHO recommended 22.8 per 10,000 population.[27] Majority (80%) of doctors and nurses (70%) are employed in the private sector. Programs like "Field Epidemiology Training" and "Field Epidemiology Laboratory Training" have been proven

useful in orienting the staff in epidemiology and evidence based public health practice.

Health care financing needs boost to address unprecedented global emergencies and pandemics in future like COVID-19. The present pandemic of COVID-19 has demonstrated an urgent need to strengthen six building blocks of health system and implement the same to ensure Universal Health Coverage and Global Health Security simultaneously. Area of concerns identified in the manuscript will ensure primary care readiness for national health security.

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## Conflicts of interest

There are no conflicts of interest.

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