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JANUARY 2023, ₹50

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Interview

Dr Sanjay Katkar
Joint Managing Director & CTO,
Quick Heal Technologies

Radiology
A number of challenges
impede radiology training
in India



**SPECIAL
ISSUE**

PUBLIC HEALTH IN INDIA THE JOURNEY AHEAD

The public health system needs to be reinforced authentically with involved efforts from all stakeholders



PUBLIC HEALTH IN INDIA THE JOURNEY AHEAD

The public health system needs to be reinforced authentically with involved efforts from all stakeholders

By Kalyani Sharma





SPECIAL
ISSUE



In the backdrop of spike in COVID-19 cases in China, PM Modi recently chaired a high-level meeting to assess the COVID-19 situation in the country, along with preparedness of health infrastructure and logistics, status of the vaccination campaign in the country and the emergence of new COVID-19 variants and their public health implications for the country. He stressed the need to ensure that the entire COVID infrastructure at all levels is maintained at a high level of preparedness in terms of equipment, processes and human resources. He advised states to audit COVID specific facilities to ensure operational readiness of hospital infrastructure, including oxygen cylinders, PSA plants, ventilators and human resources.

India has entered a new era in public health during the past few years. The COVID-19 pandemic made us realise the importance of strengthening the public health system even more. The stakeholders have been working on strategies focused on greater accessibility and availability of healthcare but we still need more high impact interventions in this direction. But as we near the third anniversary of the COVID-19 pandemic, there is also hope that the lessons of the COVID years are being translated into better implemented public health policies.

Explaining the true meaning of a public healthcare, Anurag Khosla, MD & CEO, Aetna India said, "Public Healthcare, doesn't mean treating one patient at a time. It is structured on the pillars of affordability, availability, accessibility, acceptability and accommodation. Public healthcare is about diseases prevention for the community or the populace by the healthcare service providers by pinpointing and tapping epidemiological solutions. Clinical care along with healthcare outreach at scale are ways to curb the spread of diseases. A strong ground has to be etched to provide comprehensive primary



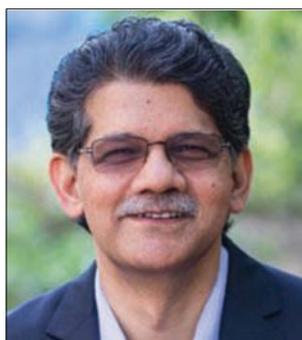
A public health cadre should not be solely focused on doctors but should be developed as an inter-professional cadre that also includes nurses, epidemiologists, social workers, policy and management experts, engineers and social scientists

Dr Santy Sajan
Group COO, Paras Healthcare



Public Healthcare, doesn't mean treating one patient at a time. It is structured on the pillars of affordability, availability, accessibility, acceptability and accommodation

Anurag Khosla
MD & CEO, Aetna India



The COVID-19 pandemic has brought out the strengths and weaknesses of India's social, financial, and health systems. It is time to introspect, learn, and resolve to build stronger and more resilient health systems that assure health security for all.

Dr Krishna Reddy Nallamalla
Regional Director, ACCESS Health International President, InOrder, the Health Systems Institute



One of the key learnings from the COVID pandemic was the need for resilience focusing on how to manage disruption of supplies and mismatch between demand and supply for materials

Dr Anup Warriar
Consultant- Infectious Disease & Infection Control, Aster Medcity



The global panic behind COVID-19 made us expedite the process of developing quick solutions for disease management and rapid vaccine deliveries

Dr CMA Belliappa
Chief Medical Officer, Rx Dx Healthcare

care, free essential drugs and diagnostic services, along with aiding financial risk protection to the vulnerable fragment rising from secondary and/or tertiary care hospitalisation."

The previous waves of COVID-19 brought up many lessons needed to be learnt and implemented especially in the sector of public healthcare system, which was egregiously meagre to meet the health needs of the vastitude. While, India prepares itself for assumed new wave of COVID, it is important to understand and implement the learnings from the pandemic for a better and improved public healthcare system.

Health systems and policies play a crucial role in determining how services are delivered, utilised, and affect outcomes in the health sector. The public healthcare system across the globe is a collection of all the organised activities that prolong life, promote the health and efficiency of its citizens and prevent diseases, such as infections caused by viruses and bacteria.

According to the Centers for Disease Control and Prevention (CDC), "Public health systems are commonly defined as all public, private, and voluntary entities that contribute to the delivery of essential public health services within a jurisdiction." This article briefly states the lessons and how we learn them to make a better public health infrastructure. It aims to highlight critical concerns in India's public healthcare system and areas that require prioritising actions based on lessons learnt from the recent pandemic.

Experts throws light on the major learnings learnt from the previous waves:

Dr Krishna Reddy Nallamalla, Regional Director, ACCESS Health International President, InOrder, the Health Systems Institute said, "The COVID-19 pandemic has brought out the strengths and weaknesses of India's social, financial, and health systems. It is time to introspect, learn, and

resolve to build stronger and more resilient health systems that assure health security for all. There are certain clear lessons that came out from across the globe. Countries with strong public health and primary healthcare saved more lives. Countries that engage and empower communities demonstrated resilience. Countries that have learned from previous health shocks and prepared their systems for the next shock fared better. Countries where universality prevailed over individuality as an ideology, could mount an effective collective response. Countries in which people trust their leadership and government did better. Countries that invest in research and development had a clear edge in their response to tackling the pandemic.”

Dr Anup Warriar, Consultant- Infectious Disease & Infection Control, Aster Medcity said, “One of the key learnings from the COVID pandemic was the need for resilience - focusing on how to manage disruption of supplies, how to manage sudden absence of healthcare workers and how to manage the mismatch between demand and supply for materials (including lifesaving oxygen). The importance of local manufacturing to preserve supplies and "stewardship" in utilisation of scarce/important resources (medicines/oxygen) was well acknowledged during this period. Going forward, robust systems to ensure quality of locally manufactured products and sustainable oversight mechanisms for ensuring appropriate utilisation of resources will be extremely important. This means establishment or increasing the scope of existing regulatory bodies that will be able to carry out this activity.”

Dr CMA Belliappa, Chief Medical Officer, RxDx Healthcare stresses, “The global panic behind COVID-19 made us expedite the process of developing quick solutions for disease management and rapid vaccine deliveries. Unfortunately, and as a

hard lesson, we have learned that necessary innovation in healthcare occurs during a tough time, and with the cost of many lives. Going forward, we should be better prepared to

handle any unprecedented health crises in the future. By devising effective remedial actions and implementing proactive measures in the system, public health can be well

augmented for the common good.”

Dr Karthiyayini Mahadevan, Head, Wellness and Well-being at Columbia Pacific Communities highlights, “Pub-

lic health system, though designed well, needs to be reinforced in an authentic manner with involved efforts from the government and related agencies to gain the confidence of

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the larger communities so that they benefit from it.”

There are many ways in which public health systems can be improved. From encouraging innovation and manufacturing of medical equipments, vaccines, PPE in the country to spending more on medical research, the system needs investment. There is a lot that can be done both in the long and short term to stabilise the public health system.

Akshat Bhatt, Principal Architect, Architecture Discipline said, “The COVID-19 pandemic exposed a severe lack of healthcare infrastructure across the world. India has also fared poorly on health infrastructure indices for many years-the Human Development Report 2020 shows a national ratio of only five beds per 10,000 people. This inadequacy was further exacerbated during the COVID-19 pandemic resulting in medical infrastructure being placed under extreme stress. As governments around the world were forced to set up temporary and makeshift hospitals to help deal with the growing number of patients, it became apparent that upgrading infrastructure to meet the needs of a burgeoning population by conventional methods was too slow a process. I believe that to address situations like this, we need to do two things- have a longer development cycle, which may be larger, slower interventions, and an immediate system that can be rapidly deployed. In unprecedented scenarios such as the outbreak of the corona virus, nimble and agile systems need to be put in place to augment existing infrastructure.”

Infrastructural development and investment

Strong public health infrastructure is the foundation of all public health services from vaccinations to chronic disease prevention programs to emergency preparedness. It should address the health departments, workforce development



Public health system, though designed well, needs to be reinforced in an authentic manner with involved efforts from the government and related agencies to gain the confidence of the larger communities so that they benefit from it

Dr Karthiyayini Mahadevan

Head, Wellness and Wellbeing at Columbia Pacific Communities



In unprecedented scenarios such as the outbreak of the corona virus, nimble and agile systems need to be put in place to augment existing infrastructure.

Akshat Bhatt

Principal Architect, Architecture Discipline



With a well-equipped infrastructure, public health system can provide high-quality, long-term, patient-centred services for both planned care and unforeseen pandemics

Sunayana Singh

CEO, ORGAN India



It's become clear that hospital infrastructure in India today needs to cater not only to the burgeoning population but also be ready to tackle the demands of a pandemic like COVID

Arti Gugnani

Partner, Vijay Gupta Architects



The HCPs across public and private provider facilities need to be trained to a certain benchmark of technology adaptation to provide quality healthcare support even in rural areas

Mohit Sood

Regional Managing Principal, ZS India

and training, data and information systems, planning, and partnerships.

Sharing her views on this, Sunayana Singh, CEO, ORGAN India said, “Infrastructure is crucial to improve the quality of treatment, diagnosis and welfare of all patients. Currently there is a huge disparity in public healthcare infrastructures and private healthcare infrastructures. There is a need to bridge this gap. The healthcare system must be able to cater to a population-wide health promotion, prevention, and self-care module. Better infrastructure will ensure quicker and less expensive healthcare. With a well-equipped infrastructure, public health system can provide high-quality, long-term, patient-centred services for both planned care and unforeseen pandemics.”

Elaborating on the challenges, Arti Gugnani, Partner, Vijay Gupta Architects said, “It's become clear that hospital infrastructure in India today needs to cater not only to the burgeoning population but also be ready to tackle the demands of a pandemic like COVID. The reality, which became only more pronounced because of the pandemic, is that there remains a massive gap in the doctor to population ratio, with a doctor to patient ratio of 1:1500. The patient to hospital bed ratio is worse, not helped by the surge of patients during times of crisis. What this presents is an opportunity to rethink how we plan healthcare infrastructure, especially for a rural population that forms a majority of our country. The need of the hour is more professionals to cater to the masses, which inevitably means setting up more medical colleges. The shortage of trained professionals does not just pertain to doctors, but also trained nursing staff, that ensures the day-to-day functioning of a hospital. This shortage could be addressed through attaching medical colleges to existing government healthcare centres, setting up training

facilities as a compulsory add-on to existing medical colleges, etc.”

Talking on the similar lines, Mohit Sood, Regional Managing Principal, ZS India said, “There are rapid headwinds in acquiring the right talent for meeting the demand of skilled healthcare professionals, at the same time, upskilling the existing workforce is equally crucial. In the coming times, technology will fuel the health cycle for any individual through AI and digital interventions at all the stages starting from awareness, diagnosis to treatment and recovery. The HCPs across public and private provider facilities need to be trained to a certain benchmark of technology adaptation to provide quality healthcare support even in rural areas.”

Dr Santy Sajan, Group COO, Paras Healthcare stresses, “The existing health professional education system in India does not emphasise the acquisition of management and public health skills. Although they receive training in individual clinical treatment, doctors are rarely given the right learning opportunities to manage healthcare facilities and programmes or perform population health duties. To support community health involvement, disease surveillance and response systems, management of health promotion and prevention programmes, monitoring, and evaluation, as well as leadership and team management of funds and other resources, a wide range of competencies are required. A public health cadre should not be solely focused on doctors but should be developed as an inter-professional cadre that also includes nurses, epidemiologists, social workers, policy and management experts, engineers and social scientists. This will enable them to work in inter-professional teams that can address the full spectrum of population health needs within India's complex health system.”

Public health services have



In a few states such as Kerala, Tamil Nadu and Delhi public health facilities play their intended role of being the first point of care but that's not the case in Uttar Pradesh, Bihar & Jharkhand

Rajapandian R

Chief Executive Officer, Sustainable Healthcare Advancement (SUHAM) Trust



There is an urgent need to upgrade, modernise and expand the infrastructure. Public and private entities must ramp up their investments into the healthcare sector

Runam Mehta

CEO, HealthCube



The pandemic has also taught us the criticality of access to real-time data, improved monitoring and isolation facilities, and better diagnostics

Dr Shuchin Bajaj

Founder Director, Ujala Cygnus Group of Hospitals



Although the investment levels are growing, they remain minuscule against what is required to achieve universal healthcare in the country or to achieve the Sustainable Development Goals

Himanshu Sikka

Practice Lead-Health, Nutrition and WASH IPE Global



The aspects of public health system that should be the focus of government policy and expenditure are identification of the diseases that need focussed treatment/eradication

Mohit Nirula

CEO, Columbia Pacific Communities

not been focused upon for decades in the majority of Indian states. However, public health services have proven to be irreplaceable during the crisis. They've shouldered the lion's share of not just preventive and outreach services but also clinical care. In fact, states with robust public health systems like Kerala have been far more successful in containing the spread of the infection, compared to richer states like Maharashtra and Gujarat, which have under-staffed public health systems. Considering these facts now is the time to reinvent and rejuvenate public health services across the country.

Talking about inter-state and intra-state variations, Rajapandian R, Chief Executive Officer, Sustainable Healthcare Advancement (SUHAM) Trust said, “In a few states such as Kerala, Tamil Nadu and Delhi public health facilities play their intended role of being the first point of care but that's not the case in Uttar Pradesh, Bihar & Jharkhand.”

Stressing on the investment part, Runam Mehta, CEO, HealthCube said, “Significant investment in public health infrastructure is critical. Currently, there are insufficient investments to set up diagnostic labs and basic healthcare facilities or necessary equipment. Even in places where diagnostic infrastructure exists, it is out-dated. Dilapidated machines that frequently break down or give incorrect assessments are as dangerous as not having the diagnostic support. Budgetary allocations are inadequate to fund new infrastructure. Most of the budgets are spent on maintaining the existing infrastructure and paying salaries of medical staff.”

“There is an urgent need to upgrade, modernise and expand the infrastructure. Public and private entities must ramp up their investments into the healthcare sector. While setting up more medical education, research and development facilities, and innovation

centers is important, it is also time to reimagine how we deliver care. Development and deployment of cost-effective digital diagnostic devices is a viable option. It leads to convenient, quick, accurate and low-cost access to diagnostic support in all terrains & climatic conditions. This model will also lead to early identification disease and help with prevention. Thus, insurers get to pay less claims and the government can better utilise its healthcare allocations. Adequate funding and determination will help to achieve the goal of quality healthcare and a better life for all Indians”, she added.

On the investment part, Dr Warriar highlights that, “Worldwide, the major reason for fatalities in the pandemic was a mismatch between the available healthcare infrastructure and the demand of specialised healthcare services - like oxygen support and ICU management. The importance of appropriate triaging in the community/home/OPD, early identification of those who require hospital-based care and those who require ICU based care was essential in allocation of resources as per need and not as per "first come, first serve" basis. We realise that we need significantly more special care beds - air borne isolation and ICU. However, it's impossible to create the ideal ICU requirement beds and air-borne isolation rooms in anticipation and not have any utilisation. Hence, the hospital design and planning must consider "pandemic preparedness" - investments focusing on indoor air quality, interventions like upper room UV irradiation, provisions for scaling up the electrical/medical gas/vacuum lines to initiate ICU care when required. The government must also invest in a regulatory body/oversight committee that may be able to ensure appropriate utilisation, prevent wastage of resources and monitor outcomes with cost optimisation. Hence, the investments in public health



Accessibility, Affordability and Quality of healthcare remains a challenge for India

Atul Kurani-VP
Global Head,
Medical Practice & IOT,
Capgemini Engineering



Healthcare data needs to become a policy focus for India. Currently, this data in India is largely unavailable or fragmented

Dr Vishesh Kasliwal
Founder & CEO,
Medyseva



Healthcare personnel will need to learn how to harness data and understand it to enhance medical practitioners' decision-making as technology and healthcare analytics are increasingly used to treat diseases

Vikram Thaploo
CEO, Apollo Telehealth



With aging infrastructure & increased demand for more beds, it is essential to optimise inpatient and outpatient settings and integrate digital technologies

Manoj Choudhury
Director, Edifice Consultants



The country's public healthcare system must keep up with technological advances and their implications for citizens' health. We should be aware that data is essential for any public health program and need for evidence-based decision-making

Satish Kannan
Co-founder & CEO, MediBuddy

must not be limited to "built infrastructure" but also in building "systems" that ensure rational utilisation of the resources.”

Dr Shuchin Bajaj, Founder Director, Ujala Cygnus Group of Hospitals talks about the increased investment in public health sector, especially bolstering infrastructure, and facilities in tier 2 & 3 cities. He added, “The gaps and lack of investment in healthcare centers were prevalent at the peak of the pandemic when fatality rates were high and increased hospital load. This made us realise the need to increase clinics and hospital chains in these cities so that the residents have equal access to quality healthcare systems and robust insurance plans. The pandemic has also taught us the criticality of access to real-time data, improved monitoring and isolation facilities, and better diagnostics. It is high time that the infrastructure in these areas is ramped up. In that direction, our healthcare bodies would need to make a substantial amount of investment in this sector regularly, which it has shown strong signs of in the past two years.”

Stressing on the importance of health financing, Dr Nallamalla added, “Health financing remains a critical issue both for strengthening fragile health systems and for protecting people against financial hardships in seeking the needed healthcare. Both the central government and state governments have limited fiscal space to immediately increase the budgetary allocation to health, despite a consensus that public health expenditure should increase to 2.5 per cent of the GDP. In this context, an alternate solution is to increase the efficiency and effectiveness of public health financial management. Nearly 20 percent of the allocated budget remains unspent every year. An additional 20 percent of the expenses are being spent on low-value care (consulting, diagnostic, and treatment services that are not

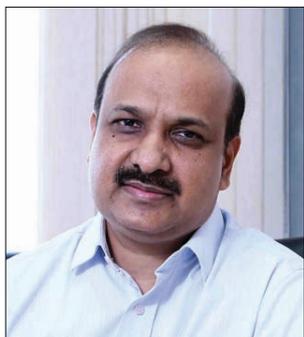
needed). Corruption eats further into the meager budgets. The productivity of the health workforce can be improved by addressing absenteeism. The end goal of Universal Health Coverage (UHC) is still a distance away. Innovative insurance and health consumer financing models leveraging the power of fintech and insurtech digital solutions should be explored while the country inches towards UHC.”

Himanshu Sikka, Practice Lead-Health, Nutrition and WASH IPE Global Limited gives an overview of the current investment level. He said, “In the Economic Survey of 2022, India’s public expenditure on healthcare stood at 2.1 per cent of GDP in 2021-22 against 1.8 per cent in 2020-21 and 1.3 per cent in 2019-20. While many critiques would comment on this substantial increase as plain accounting jugglery, the fact remains that several public sector schemes launched in the last few years, including the Pradhan Mantri Ayushman Bharat Health Infrastructure Mission, have focused on building last-mile infrastructure, which has been depriving the 40 per cent bottom of the pyramid population (over 500 million people) of quality and affordable healthcare services. The same mood can be seen in the private healthcare sector. The commercial investment levels for healthcare, which stood at half a billion US dollars (US \$) per year for the first half of the last decade, had seen the market opportunity India presented and reached levels of US \$800-900 million in pre-COVID years. The pandemic pushed these investment levels to US \$1.2 - \$1.3 billion per year and are expected to be close to US \$2 billion by the end of the current financial year. In terms of Official Development Assistance from OECD countries to India, though the grant-based funding came down considerably in the last decade, the confidence of multilateral financial institutional lenders like the World Bank and ADB grew to



While access to care has dramatically improved in recent times, the focus should also shift towards producing measurable health outcomes at population level around areas like prevention, chronic disease management, lifestyle, and nutrition

Srinivasa Vivek
Co-Founder, Resolute Active Care



We will have to re-examine our current capacities for service provision from two dimensions: adequacy and distribution.

Prof. Sanjay Zodpey
President, Public Health Foundation of India (PHFI)



Perhaps this year is the time to map the current coverage of PHCs as well as the sub-centres, along with community health centres as well as tele-health options and be pragmatic about making this jigsaw puzzle of taking health to the last mile work

Shrirupa Sengupta
Associate Director, Swasti, The Health Catalyst



Embedding digital technologies into policies can make the entire process a lot more seamless and accessible for people across the country

Paul Abraham
President, Hinduja Foundation



Developing preventive rather than reactive mechanisms and enhancing the necessary components of community information, mobilisation and participation is the key

Dr Vishwanath V Bellad
HOD & Senior Consultant Pulmonologist, BGS Gleneagles Global Hospital

an all-time high for sovereign lending to the health sector. Both institutions manage a US \$2-3 billion health sector portfolio for the country. They have further approved new billion-dollar loans to support Government of India programs and schemes in the current year.”

Highlighting the challenges and the promise of blended finance and impact investing, he added, “Although the investment levels are growing, they remain minuscule against what is required to achieve universal healthcare in the country or to achieve the Sustainable Development Goals. Public health infrastructure is a high government priority, with most public sector funding focused on lower-tier towns and rural areas. However, the participation of the private sector in the same has been limited. Private capital has largely found a home in major metros and tier-1 towns and shied away from riskier propositions of funding infrastructure focused on providing affordable care to the bottom of the pyramid, hard-to-reach, and vulnerable populations. These have been largely left for being serviced by the public sector. This dichotomy of funding has meant that social enterprises, typically healthcare start-ups and Micro, Small & Medium enterprises, providing affordable healthcare and focussing on lower-tier markets and rural areas, have remained wanting affordable capital to scale their operations. The situation gets exacerbated when mainstream banks for whom health forms part of priority sector lending in the country are also not comfortable financing the MSME and early-stage enterprises in this sector and see the space as high risk and long gestation. This was quite visible in the limited uptake for the Loan Guarantee Scheme for COVID-Affected Sectors (LGSCAS) launched by The National Credit Guarantee Trustee Company Ltd (NCGTC).”

“Government is privy to

these challenges and encouraging homegrown innovations both tech and process that can help it achieve its universal health care mandate. The government also recognises that new ways of working are required to unlock greater commercial investments to supplement its limited resources. Blended Finance, which looks at leveraging commercial capital for social enterprises by de-risking investments using grant/philanthropic capital, along with Impact Investing, is thus emerging as a promising potential solution.”

Mohit Nirula, CEO, Columbia Pacific Communities shares the aspects public health system that should be the focus of government policy and expenditure which are, “identification of the diseases that need focussed treatment/eradication; development of a series of high-impact steps that need to be taken to address identification of disease, reporting, treatment execution combined with real time monitoring of performance data; communication through mediums that reach the at-risk population with the objective of increasing awareness and finally and political commitment to allocate resources to fund these initiatives and ensure achievement of mission objectives.”

“It is a travesty that while government expenditure on public health systems has tripled over the last decade (from Rs 23.5 thousand crores to Rs 62.6 thousand crores), the share of government spending has remained moribund at about 1.3 per cent of GDP spiking only in the last couple of years only on account of COVID-19. In comparison, developed nations such as the US and Japan spend close to 10 per cent of their GDP on their public health systems.”

Role of connected health in public health

Digitisation and connected healthcare have the power to enhance overall accessibility and availability of care. It can

also help in empowering the large population at the same time. The pandemic highlighted the role of technology on a large scale. Technologies like telehealth and remote patient monitoring saw prominent adoption during the pandemic.

Technology has been effectively used in training healthcare workers, digitising health records, diagnosing and detecting health problems, and more. A patient can leverage health-related data to efficiently receive personalised and proactive care. Devices and services are also designed around a patient's needs. Connected health effortlessly links

and empowering the rural & semi-urban primary care clinicians in taking informed decisions focused especially on chronic diseases management. This will enable transition into a more proactive/preventive care than being reactive, one of the main reasons for high mortality rates in the country.

Additionally, India, with a robust digital connected backbone, can facilitate large community based clinical trials necessary to prove the efficacy of the products getting developed for our markets, driven by value-based health outcomes.”

Dr Belliappa while emphasising on the role of digital

sights into strategies to improve the effectiveness and efficiency of health services and measuring the impact of new health policies and interventions.

Dr Vishesh Kasliwal, Founder & CEO, Medyseva said, “Healthcare data needs to become a policy focus for India. Currently, this data in India is largely unavailable or fragmented. This is because there is no single system integrating information of patients seeking services at private and public delivery points. Without such data, good policy-making cannot be expected. During the pandemic, we witnessed some examples where good

healthcare services in real time to those who need it the most.”

Vikram Thaploo, CEO, Apollo Telehealth opines, “Healthcare personnel will need to learn how to harness data and understand it to enhance medical practitioners' decision-making as technology and healthcare analytics are increasingly used to treat diseases. Additionally, as COVID-19 has drawn attention to the necessity of managing epidemics and pandemics, there must be a mandate for public health professionals in government. IoT can also be utilised to gain useful insights from data collected from electrocardiograms, temperature monitors, blood glucose levels, and foetal monitors. Smart IoT devices can deliver the necessary health data remotely, reducing the necessity for face-to-face interactions between patients and doctors. In an IoT world, various distributed devices will collect, analyse, and transmit real-time medical data to open, private, or hybrid clouds, enabling the collection, archival, and analysis of large data streams in multiple new forms as well as the activation of context-sensitive alarms.”

Stressing on the need for designing healthcare spaces accommodated with modern technology, Manoj Choudhury, Director, Edifice Consultants added, with aging infrastructure & increased demand for more beds, it is essential to optimise inpatient and outpatient settings and integrate digital technologies like Telemedicine, Artificial intelligence, Robotics, Precision medicine, Genomics, IoMT, EMR, and Cloud Computing into traditional services. Even in the pre-COVID era, digitisation was considered the best way to transform healthcare practice, the pandemic has led us to prioritise patient-centric remote monitoring solutions. Healthcare environments are not just buildings accommodating modern technology for treating ailments and diseases. To facilitate the dual purpose of

Sharing health systems data with the research community can also provide insights into strategies to improve the effectiveness and efficiency of health services and measuring the impact of new health policies and interventions

all integral pieces of a healthcare system through technology to ensure medical facility, services, and care for all, anytime and anywhere.

Talking about connected healthcare, Atul Kurani-VP, Global Head, Medical Practice & IOT, Capgemini Engineering said, “Accessibility, Affordability and Quality of healthcare remains a challenge for India. Lakhs of patients go without access to primary healthcare every day due to poor Healthcare infrastructure, shortage of doctors, poor diagnosis, wrong treatment, high cost, inadequate medicines which results in millions of deaths every year. Through data and technology enabling connected health solutions, India's focus of improving access, affordability, and quality of care with reduced human errors can be achieved with specialist opinion available to the rural/semi-urban masses where we have over 70 per cent of the populations residing. Digital platforms will enable in educating

channels added, “As the pandemic-induced lockdowns restricted the overall movement of people, telemedicine turned out to be a game changer in that period. It has also prevented crowding at medical facilities. A large number of people have been treated through apps and other digital platforms, which became an integral part of public health. By incorporating health services through digital communication channels, people from remote areas where even bare essential medical services are often unavailable will receive a great amount of assistance.”

Healthcare data and disease surveillance are also crucial and play a much bigger role in preventing and managing the future pandemics. By leveraging data during the pandemic, the healthcare sector has been able to trace the pandemic's spread, monitor population health.

Sharing health systems data with the research community can also provide in-

data collection and analysis, by some government as well as volunteer organisations, led to good decisions. For example, there emerged a number of platforms to track case numbers, fatalities, hospital bed availability and so on. State governments such as that of Tamil Nadu built GIS platforms to track containment zones and hotspots of infection, thereby deploying the necessary resources to the areas that required them. This needs to be replicated on a large scale to cover the entire country and the large spectrum of diseases. Using big data in healthcare with electronic health records, government records, laboratories and insurance companies can provide a rich source of information to healthcare providers to assess clinical risk and genetic susceptibilities. Combining healthcare data with other parameters related to transport and housing, for instance, could be used to generate healthcare plans and deploy

supporting the future health workforce and meeting the medical challenges of our time, we must design our healthcare systems to navigate a holistic approach. In India, the healthcare sector largely depends on the public healthcare system for its population. Today, the private healthcare sector has emerged to provide the majority of secondary and tertiary care in metros, tier I and tier II cities. Innovative long-term partnerships between the public and private healthcare sectors can bring about a significant change in the system, especially during an unanticipated crisis like COVID-19. Therefore, designing the right built environment with sufficient investments from the stakeholders plays a strategic role in shaping the future of healthcare."

Satish Kannan, Co-founder & CEO, MediBuddy believes that the adoption of technology is the future of healthcare. He highlights, "The country's public healthcare system must keep up with technological advances and their implications for citizens' health. We should be aware that data is essential for any public health program and need for evidence-based decision-making. The Integrated Disease Surveillance Program has been the backbone of the country, where the decentralised surveillance mechanism attempts to conduct indicator and event-based surveillance to respond to public health emergencies as soon as possible. The system must be strengthened further, prioritising staff capacity building. Laboratory networks must be expanded so that basic testing facilities are available at all of the country's peripheral health/wellness centres. Public health laws require the private health sector to participate in disease surveillance mechanisms actively. To get a more regularised healthcare infrastructure, Government policies launching universal healthcare initiatives, such as the National Digital Mission and Ayushman Bharat, would

Digitisation and connected healthcare have the power to enhance overall accessibility and availability of care

aid in centralising health insurance and convenient access to healthcare. Consistent progress and innovation in biomedical science would be another feather in the hat of the Indian healthcare infrastructure facility. The entire ecosystem needs a targeted approach while addressing these significant issues."

Srinivasa Vivek, Co-Founder, Resolute Active Care stresses, "It is evident that the public health infrastructure has become hybrid with both digital and physical care delivery. While access to care has dramatically improved in recent times, the focus should also shift towards producing measurable health outcomes at population level around areas like prevention, chronic disease management, lifestyle, and nutrition."

Leveraging the power of policy makers and acknowledging the importance of preventive care

India has a large network of Primary Health Centres (PHCs) and sub-centres along with community health centres, mobile vans and traveling health camps. The health sub-centre, as defined by the National Health Mission is the most peripheral and first contact point between the primary health care system and the community. Despite this seemingly fool proof framework, the picture on ground still requires attention.

Prof. Sanjay Zodpey, President, Public Health Foundation of India (PHFI) explains, "We will have to re-examine our current capacities for service provision from two dimensions: adequacy and distribution. While two-thirds of India lives in the rural and semi-urban areas, our health care

services, especially in the private sector, are located in urban areas. This creates a situation wherein there is a greater stress on the health infrastructure, both public & private, in the rural areas of the country during a pandemic. This is a structural problem which does not have a short-term solution. The government has significantly increased the capabilities of district hospitals in the past five years and is committed towards implementing the updated Indian Public Health Standards for health care institutions. This is a welcome step and will certainly yield positive results in the medium-term. The community is the focal point for all the public health action. It has the capacity to amplify the government's response through its meaningful participation. Community participation is dependent on a clear and sound call to action. The state and district health systems will have to travel the extra mile through the formal and informal networks that exist within the community. The presence of the Health and Wellness Centres across the country will provide the last mile connect, but we will need a continuous engagement with the community on all health matters round the year for it to partner with us at short notice. We will have to think of newer paradigms of community engagement in health in the times to come. We will have to maintain emphasis on supporting government efforts through a broad-based partnership with voluntary organisations, civil society, and non-governmental organisations."

Shrirupa Sengupta, Associate Director, Swasti, The Health Catalyst highlights, "Sadly, in many poor states, such as Madhya Pradesh,

Bihar and Jharkhand, a PHC covers as many as 45,000, 49,000 and 76,000 people. And while tele-medicine/tele-health is an approach that the Government of India is keen on - the digital divide persists. And, the current location of PHCs is also not too helpful. Let us take for example In Rajasthan, the population is often so dispersed (especially in hilly areas in the south and in the desert in the west) that a family may need to travel 10-20 km to reach the nearest health centre. Perhaps this year is the time to map the current coverage of PHCs as well as the sub-centres, along with community health centres as well as tele-health options and be pragmatic about making this jigsaw puzzle of taking health to the last mile work. All the while keeping in mind the reality of the digital divide and the hurdles of rural transport. At present under all the plans of Government of India, the PHCs are expected to deliver centrally designed, targeted vertical programs. While from a clinical perspective this may be a great logic map, it ends up alienating PHCs further from communities and this may be the right time to rethink the PHC framework also in line of how health and wellbeing is partnered between the communities at the last mile and the Primary Health Care system."

Talking about leveraging the power of policy makers, Paul Abraham, President, Hinduja Foundation said, "There is no doubt that India's public healthcare system is in dire need for the intervention of policy makers and government initiatives. There has been a modest increase in budget allocations over the last few years, but this has to increase to a large extent. The

recommendation of the National Health Policy is that budget outlay of both Centre and State should be increased to over 2.5 per cent. Further, it is also recommended that state budgets are allocated with an increased 8 per cent of the total budget. The Prime Minister's Ayushman Bharat Digital Mission (ABDM) is a quintessential example of government intervention to better the public healthcare system. The country needs more such interventions. Embedding digital technologies into such policies can make the entire process a lot more seamless and accessible for people across the country."

Dr Vishwanath V Bellad, HOD & Senior Consultant Pulmonologist, BGS Gleneagles Global Hospital emphasises, "Developing preventive rather than reactive mechanisms and enhancing the necessary components of community information, mobilisation and participation is the key. It highlights the need to greatly increase human and financial resources and the regulation of the private sector to curb profiteering from the pandemic and reduce out-of-pocket expenditures."

Sood added, "post-pandemic there has been a rise in general health awareness among people highlighting that the focus needs to shift from curative to preventive healthcare. Early and timely diagnostics through access to medical records using digital health tech would bring emphasis on addressing the medical needs of a patient before it becomes life-threatening."

Way forward

Enhanced preparedness and response system, creating quality healthcare infrastructure and broadening the community engagement in health will go a long way in not only strengthening the public health but also managing the future pandemics.

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