



Covid-19 induced healthcare transformation in India

Report



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Foreword by FICCI

The repercussions of the ongoing global Covid-19 outbreak have exposed the inherent shortcomings of existing healthcare systems, thus paving the path to rethink and re-evaluate the future healthcare ecosystem. It has also provided us with the opportunity to discover new approaches for healthcare delivery to promote accessibility, availability, and affordability of quality care.

For Indian healthcare system, the pandemic has triggered much needed radical reforms. Today, healthcare is at the centre-stage like never before- whether it is through our increased public spending focus on augmentation of healthcare infrastructure, or the revolutionary innovations and collaborations seen amongst all the stakeholders, whether public or private.

However, while we work towards our collective capacities for short term health challenges, it is also imperative to collaboratively work towards pandemic prevention as well as preparedness and create a definitive roadmap for transformation of future healthcare system beyond the pandemic. This includes enhanced public health measures and communication strategies, better usage of telemedicine and remote patient management, augmented use of digital and emerging technologies, new concepts for healthcare facilities, optimisation of operations and costs as well as expanding indigenous production capacities etc.

FICCI has been working extensively in the healthcare sector as a change agent and has constituted multi-stakeholder forums to provide thought leadership. Over the years, we have developed numerous recommendations and knowledge papers to suggest

policy and regulatory reforms for betterment of the sector. FICCI has also been actively engaged with the government and the industry for the response to Covid-19 pandemic whether through facilitation of supplies and logistics, suggesting various measures to be taken, or mediating partnerships between stakeholders.

Through this publication on 'Covid Induced Healthcare Transformation in India', FICCI and KPMG India aim to conduct an in-depth assessment of how India's innovative and expedient response approach to augment healthcare infrastructure, medical and oxygen supply, bolstering of testing capacity and rapid upskilling of workforce along with deploying a comprehensive risk communication strategy was crucial to the management and containment of Covid-19.

Further, the report delves into the collaborative efforts of private sector players and health tech start-ups and how public and private response to the pandemic collectively led to the reorientation of existing conventional health system to pave the way for transformation of the healthcare industry as a whole. Lastly, the publication probes into the six key areas of intervention revealed by the pandemic viz healthcare financing, Health system strengthening, health crises management, preparing of future workforce, private sector participation and embedding digital health solutions to bridge systemic gaps and how there is a need to act upon these recommendations with a sense of urgency to further propel the transformation set into motion by the pandemic.



Dr. Alok Roy

Chair, FICCI Health Services Committee & Chairman, Medica Group of Hospitals

Foreword by KPMG in India

The Covid-19 pandemic sent ripples of shock across the global healthcare and economic structures, causing both developed and developing nations, to fumble as they made attempts to bridge the gaps exposed by a crisis of such scale and dimension. India too, was no different. Facing challenges such as inadequate healthcare infrastructure, dearth of trained medical and paramedical workforce, a concerning doctor-to-patient ratio and crumbling medical supply chain systems, India undertook a myriad of measures ranging from making policy-based decisions, augmenting indigenous manufacturing capacities, ramping up health infrastructure and medical staff, to deploying innovative digital health and technological solutions for a holistic pandemic response.

As the Covid-19 crisis overwhelmed the nation, a paradigm shift was seen from the traditional legacy systems to cloud-based applications. India witnessed rapid deployment of digital/ remote care models undertaken by both public and private sectors to alleviate the stress on the system. Though the concept of digital healthcare predates the pandemic, the crisis proved to be a catalyst for its increased adoption, thereby, proving that necessity is the mother of all invention. At the onset of the pandemic, India's health landscape revealed the necessity to develop a robust digital public infrastructure that provides 'patient-centric' solutions to further push the ongoing healthcare revolution and bridge systemic gaps. To implement this change, India's policy makers are working towards introducing healthcare policies such as the implementation of Ayushman Bharat Digital

Mission (ABDM) and Ayushman Bharat scheme, for an improved and transparent system of healthcare delivery, and triggering synergies between public and private health entities to accelerate the process of healthcare digitisation. However, we still have a long way to go.

Presently, India is undergoing a massive healthcare transformation, with the Covid-19 crisis having triggered an expedited pace of change. This implies a crucial need for both private and public stakeholders to work together. Having said that, the onus lies more on the government to engage the private sector in restructuring and reforming the Indian healthcare structure and build platforms for active public private partnerships. Further, with increasing significance of disease and molecular surveillance systems in light of the ongoing crisis, there comes a critical need for developing and deploying innovative solutions that cater to the country's needs for a more streamlined data sharing system, at the same time addressing data security and privacy concerns and promoting a more quality and efficiency-oriented health ecosystem.

This publication, by FICCI and KPMG in India, makes a deep dive into the major disruptors and technological interventions that were triggered by the pandemic, fast-tracking the approach towards a more affordable, accessible and equitable health system. Further, the pandemic also gave rise to some historic interventions and innovations, be it in pioneering a self-reliant Covid-19 vaccine research and discovery process, in developing comprehensive and real-time IT solutions for disease surveillance or in bridging.



Lalit Mistry

Partner and Co-Head- Healthcare Sector,
KPMG in India

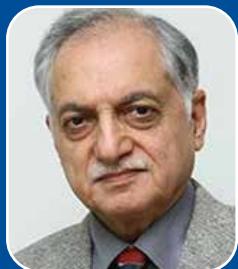
Industry voices



The entire global healthcare ecosystem has undergone a transformation. Pre and post Covid healthcare will bear no similarities to each other. The transformation in healthcare space in the last 2 years has surpassed the last 20 years...To get healthcare to improve, private sector needs to be provided its due credit. Only when it's a win-win situation, will India receive the rightful investment in healthcare that it needs.

Dr. Narottam Puri

FICCI Health Services and MVT; Board Member & Former Chairman- NABH; Hony. Professor & Advisor-IMA; Advisor-Medical Operations, Fortis Healthcare Ltd.



Home healthcare serves a three-pronged purpose, reduces hospital admissions, reduces readmissions and creates a strong alternative to affordable healthcare. What the sector lacks is skilled professionals. A key measure needed to reduce healthcare burden is upskilling and incentivizing the existing healthcare workforce. Introduce industry-oriented courses and license ASHA (Accredited Social Health Activists) workers to empower them and grow their contribution to the sector.

Dr. Gaurav Thukral

EVP & COO, HealthCare at Home (HHAC)



The three main learnings and areas that the industry needs to focus heavily going forward are healthcare infrastructure, operations and supply chain. Private sector participation played a critical role in fighting this battle with the pandemic...we can only come victorious out of this if we continue to strengthen the PPP momentum in healthcare space.

Ayanabh DebGupta

Co-founder and Jt. MD, Medica Group of Hospitals





The hospital of the future needs to follow the age-old hub and spoke modularity. This would create a dynamic healthcare system, that can adapt to any similar crisis we may face in the future. Only when the entire healthcare and life sciences sector would be under MoHFW, would HCLS become a priority and be well on its path to create accessible healthcare for all.

Dr. Shyam Vasudeva Rao

Co-Chair, FICCI Medical Devices Committee;
President & CTO at Forus Health (P) Ltd, Director at MYMO Wireless Technology (P) Ltd



It is imperative for tomorrow's healthcare system to be agile. The biggest examples of modular healthcare can be seen through diagnostic labs, that scaled up testing measures and facilities exponentially. Health and wellness is a two way street and boils down to simple facts...if you won't drive a car without insurance, why risk your life without health insurance.

Dr. Vidur Mahajan

Associate Director, Mahajan Imaging & Head (R&D), CARING (AI and Radiology)



Diagnostics sector in India is largely unorganised and functions independently. ABDM brings in the much-needed policy framework to integrate the efforts of public and private sector and work towards the common goal of public health. Scaling up private and public organisations and reforming the frameworks and policies at the state level rather than at the district level. This will also provide a single window mechanism for various clearances and licenses, leading to better clarity in collection and testing centres.

Dr. Om Manchanda

MD, Dr Lal PathLabs



The Covid-19 pandemic has transformed the way government and private healthcare players are responding to changing healthcare needs. The country has witnessed unprecedented speed of health system strengthening, cohesive efforts by all stakeholders, digital health adoption and innovation from all walks of life. Going forward the success would lie in how recent initiatives and learnings are institutionalised into building a resilient health system.

Lalit Mistry

Partner and Co-Head, Healthcare Sector, KPMG in India



List of abbreviations

ABDM	Ayushman Bharat Digital Mission
AB-PMJAY	Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana
ACT	Action Covid-19 Team
AIIMS	All India Institute of Medical Science
AMTZ	Andhra Pradesh Medtech Zone
ASHAs	Accredited social health activists
CDC	Centre for Disease Control
BIBCOL	Bharat Immunologicals and Biologicals Corporation
CDMC	Covid Drugs Management Cell
CHCs	Community Health Centres
COE	Centre of Excellence
CPHC	Comprehensive Primary Healthcare
CSIR	Council of Scientific and Industrial Research
CSO	Civil Society Organisations
DBT	Department of Biotechnology
DCC	Drugs Coordination Committee
DCGI	Drugs Controller General of India
DIB	Development Impact Bond
DoP	Department of Pharmaceuticals
DRDO	Defense and Research Organisation
EHR	Electronic Health Record
EIU	Economist Intelligence Unit
ECRP	Emergency Response and Health System Preparedness Package
EMR	Electronic Medical Record
GDP	Gross Domestic Product
GHIS	Global Health Security Index
GOI	Government of India
GIS	Global Positioning System
GPRS	General Packet Radio Service
HEOC	Health Emergency Operation Centres
HHAC	HealthCare at Home
HMIS	Hospital Management Information System
HMO	Health Maintenance Organisations
HPR	Healthcare Professionals Registry
HUID	Health Unique Identification
HWCs	Health and Wellness Centres
ICMR	Indian Council of Medical Research
IDSP	Integrated Disease Surveillance Programme
IEC	Information, Education and Communication
IHIP	Integrated Health Information Platform

IHR	International Health Regulations
IIL	Indian Immunologicals Limited
IISC	India International Skill Centre
iGOT	Integrated Government Online Training
ITIHAS	IT-enabled Integrated Hotspot Analysis System
KITE	Kerala Infrastructure and Technology for Education
KPI	Key Performance Indicator
LMO	Liquid Medical Oxygen
MeitY	Ministry of Electronics and Information Technology
MHA	Ministry of Home Affairs
MoHFW	Ministry of Health and Family Welfare
MP	Madhya Pradesh
MT	Metric Tonnes
MSME	Micro, Small & Medium Enterprises
NBSTSA	National Board of Surgical Technology and Surgical Assisting
NCDs	Non-Communicable Diseases
NDMA	National Disaster Management Authority
NHA	National Health Authority
NHP	National Health Policy
NHSP	National Health Skilling Platform
NICs	National Insurance Contributions
NPHO	National Public Health Observatory
NPPA	National Pharmaceutical Pricing Authority
NSDC	National Skill Development Corporation
NTI	Nuclear Threat Initiative
OOP	Out-of-pocket
OPD	Outpatient department
PHCs	Primary Health Centres
PHIS	Population health information system
PHR	Pers onal Health Records
PLI	Production-Linked Incentive
PMSSY	Pradhan Mantri Swasthya Suraksha Yojana
PPE	Personal Protective Equipment
PPP	Public-Private Partnership
PSA	Pressure Swing Adsorption
SDGs	Sustainable Development Goals
SEEDS	Sustainable Environment and Ecological Development Society
SHCs	Sub Health Centres
USAID	United States Agency for International Development



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Executive Summary

The onset of Covid-19 pandemic was an unanticipated occurrence, which transpired into the most devastating international health emergency of the century. The pandemic disrupted global supply chains and the governments across the world were compelled to improvise and innovate in order to tackle the emerging challenges of Covid-19. Every crisis provides significant learnings and an opportunity, if we do not again forget and get into old monotonous routines and fail to carry these life-changing learnings to our future.

The last two years of Covid-19 pandemic in India showcased unprecedented speed of system strengthening, rapid policy making and response planning, cohesive efforts by all stakeholders, and innovation from all walks of life. We have attempted to bring out some of the key takeaways from this Covid-19 pandemic response management in India and highlighted how these interventions should not be one-time efforts but have potential to create long lasting interventions in improving Indian health system.

Key areas for intervention for Pandemic Management:

Since the first case of a novel coronavirus was identified in early 2020, India, given the limitations of resources and constrained by a complete picture not emerging immediately, attempted to follow a proactive approach to the pandemic. This helped in setting up surveillance at points of entry, helping ensure testing. This approach also enabled upgrade of health infrastructure and facilitate the logistics of medical oxygen, PPEs and N95 masks etc. with the passage of time.

While the Indian government was responsible for driving majority of Covid-19 interventions such as healthcare infrastructure augmentation, bolstering testing capacity, managing supply of medical oxygen and medicines, launching the vaccination campaign, there was an emergence of innovative models for collaborations between the government and private players and participation of healthcare start-ups for accelerated transformation.

Key recommendations for future preparedness:

Response measures initiated to manage the unforeseen crisis of Covid-19, led to a seismic shift in the conventional healthcare delivery system through adoption of digital solutions. It also highlighted the need for modifying and strengthening existing health system. While unfortunate, the Covid-19 crisis turned out to be a catalyst that catapulted the transformation of Indian healthcare sector and now the responsibility lies with the government and private players to carry forward this transformation set into motion by a global pandemic and create robust and resilient health system with coordinated and cohesive efforts.

The impact of Covid-19 on health system has revealed six thematic areas that require immediate deliberation and action to fast track the transformation triggered by the pandemic.



1. Financing for "Healthy India"

- With a healthcare spending of 1.5 per cent of India's Gross Domestic Product (GDP) in 2018–19,¹ there is a need to increase the public health spending to 2.5–3.5 per cent to support the healthcare transformation. Further there is a need to incorporate alternative financing models to address the financial gaps in health sector and ensure mandatory health coverage for all to support the Universal Health Coverage (UHC) targets.

2. Health system strengthening

- Establishing district level Health System Index to assess health system maturity, modifying existing district hospitals to implement a hub and spoke model, ensuring adequate diagnostic services across all districts, promoting convergence of public health scheme, leveraging make-shift and alternative health infrastructure and strengthen primary care through collaborating with private sector are some of the steps to strengthen existing health system and broaden their capacities.

3. Robust public health crisis management

- The ongoing Covid-19 crisis has exposed the systemic gaps and brought forth the need for a comprehensive plan for pandemic management at a national and regional level. Developing an integrated national pandemic management platform that enables States to manage any disease outbreak in their region through a single portal can help in bolstering national preparedness and promoting evidence-based analysis of health data in the country.

4. Future healthcare workforce

- Indian healthcare sector continues to face the challenge of availability of human resource with demand continuing to accumulate. It is crucial to avoid a dearth of skilled medical and paramedical workforce through establishing a National Health Skilling Platform (NHSP), healthcare skilling centres across districts, and conducting digital health literacy programs to prepare a pool of skilled medical staff and technicians.

5. Improving private sector participation and support

- Encouraging synergistic partnerships and collaborations can prove to be fundamental in expediting healthcare transformation. Strategic purchasing and newer Public-Private Partnership (PPP) models can be leveraged to direct private investments to multiple healthcare projects. Further, introducing a dedicated health infrastructure development fund for developing healthcare infrastructure across Tier-II and Tier-III cities can result in swift creation of required facilities. However, to enable legally secure involvement of private sector, there is a need to simplify regulatory compliance while strengthening governance systems.

6. Embedding digital health to bridge systemic gaps

- Covid-19 set into motion a digital revolution in India and it is now imperative to incorporate digital interventions in order to enable a digital health ecosystem. With the Government's focus on Ayushman Bharat Digital Mission (ABDM) and creation of Health Unique Identification (HUID) numbers, it is equally important to uberize the referral system in the country to strengthen referral linkages, to promote telemedicine services to expand healthcare accessibility and availability, to incentivize providers for their digitization efforts, and to integrate all existing digital applications into one.

1. Budget 2021: How much does India spend on healthcare sector, The Free Press Journal, January 2021

1.

Covid-19 pandemic - outbreak and management so far





The Covid-19 pandemic has become one of the biggest health emergencies faced by the global community, affecting not only health system across nations but also economic structures. India also had to navigate through the pandemic and a myriad of other challenges by undertaking strategies to balance both the health and economic stability of the country. With all the gaps in the medical field including the frail state of India's healthcare infrastructure and a huge population along with the sudden challenges faced during the first wave in 2020, India performed relatively better than other countries such as Italy, the US, and Brazil. However, systemic issues have been identified within the system that have also served as an eye opener and have provided an opportunity to strengthen the health system on a war footing.

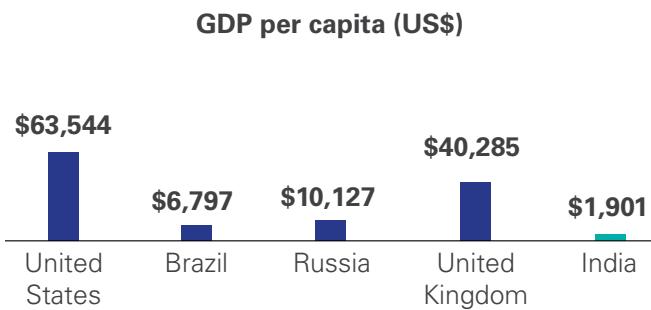
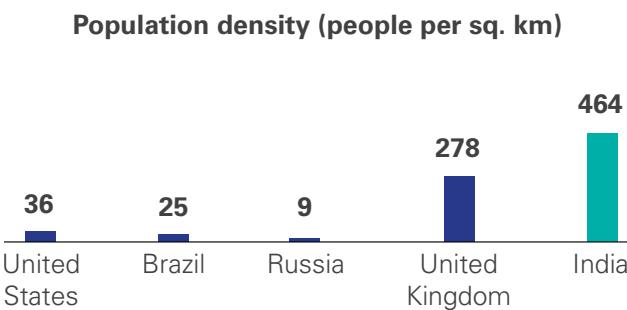


Systemic issues of Indian health system

a. Higher population density and lower GDP:

With a population of nearly 1.4 billion, 17.7 per cent of world's population, India is amongst the most densely populated nations in the world. In a country where 50 million people live on less than US\$2 a day, Covid-19 pandemic posed varied challenges to the economic state.¹ Similar to other countries, India too was vulnerable to the detrimental impact of the pandemic on the overall economy.

Exhibit 1: Population density (people per sq. km of land area)² and Gross Domestic Product (GDP) per capita³



1. India's Population Conundrum", Economic Times, 23 July 202

2. EIU, Data tool

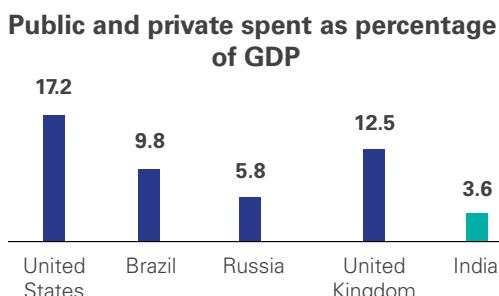
3. "GDP per capita", World Bank

b. Low Health Expenditure as a percentage of GDP

GDP: India's share of public and private healthcare spending was estimated to be 3.6 per cent of GDP including both the public healthcare spending and out-of-pocket expenses⁴ which is quite low as compared to various developed countries including

the US, the UK, Japan, Germany, and Canada whose spending is nearly 10–18 per cent of their GDP on healthcare.⁵ While India's population has grown nearly 15 per cent over the last decade, this growth has not been complimented by an equitable growth in healthcare spending.

Exhibit 2: Health Expenditure as a percentage of GDP⁶



Population and percentage GDP healthcare spend of India

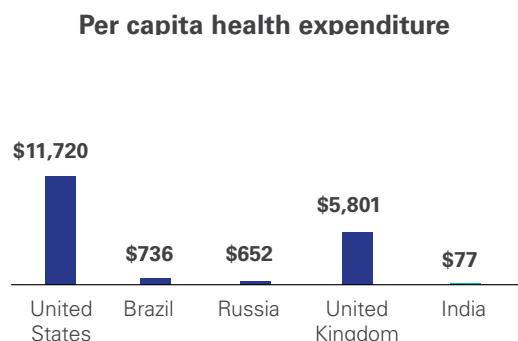


As per Union Budget 2021–22, the total public health sector allocation stood at 1.2 per cent of the GDP and it is expected to increase to 2.5 per cent of GDP by 2024–25.⁷

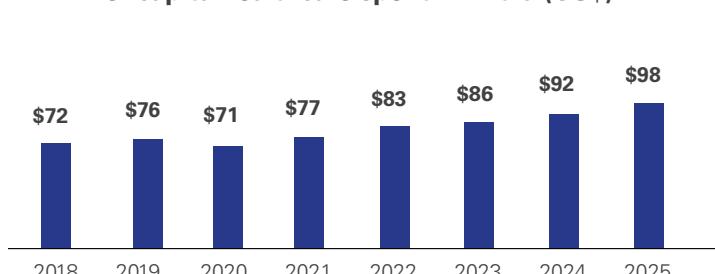
c. Low per capita health expenditure: With healthcare progressively being perceived as a GDP driver, the need to relook at various aspects of healthcare expenditure has never been more vital. Currently, India spends only US\$77 per capita on healthcare, a figure that significantly lags behind several developed and developing nations. The government anticipates the impact of Ayushman Bharat-PM Jan Arogya Yojana, which provides

free hospital cover up to INR5 lakh (US\$6,684) to 10 crore (100 million) poor and vulnerable families annually, in the coming years, increasing the per capita healthcare spend of the country. The government also foresees that the network of government run low-cost generic medicine stores (Janaushadhi Kendras) would lead to savings worth INR3600 crore (US\$0.4 billion) for beneficiaries during the current financial year.⁸

Exhibit 3: Per capita health expenditure (in US\$)⁹



Per capita healthcare spend in India (US\$)



4. Industry Report – Healthcare in India, The Economist Intelligence Unit, 2020

5. "As many as 69 per cent of hospital beds in India are concentrated in urban areas; Pune outranks other cities on health parameters", Money Control, May 12, 2021

6. EIU, Data tool

7. Budget 2021: 'Increase healthcare expenditure from 1.2% to 2.5% of GDP', Business Today, 2021

8. "India spending Rs 1,418 per capita per year on health: Govt in RS", Tribune India, 10 March 2021

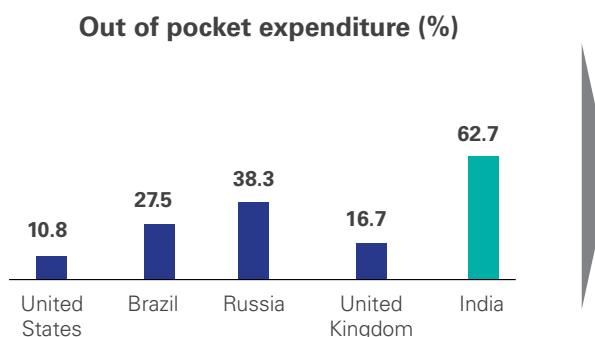
9. EIU, Data tool



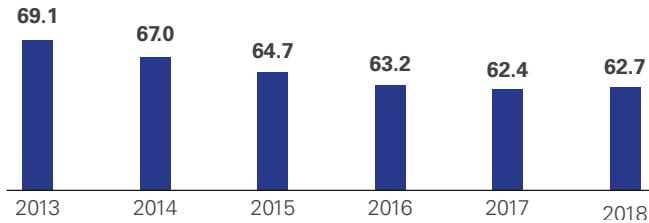
d. High out of pocket expenditure:^{10,11} Only ~10 per cent of the total number of hospitals across the country is accounted for public hospitals. Rest is operated by the private sector and a small number by charitable organisations as of June 2020.¹² Since private healthcare in India is premium and expensive, the majority of the Indian population can't afford it and the lack of modern medical equipment and technologically advanced devices in the public healthcare sector, make it a real challenge

for the common people to attain appropriate medical support. Despite a marginal decline in Out-of-pocket (OOP) expenses over the years, the proportion of such costs is quite high in India. While initiatives such as Ayushman Bharat-PM Jan Aarogya Yojna would significantly help the financially challenged sections of the society, India needs a nationalised healthcare plan to address the divide of public and private care along with managing the high OOP healthcare costs.

Exhibit 4: Out of Pocket Expenditure (percentage of current healthcare expenditure)



Out of Pocket expenditure (percentage of current healthcare expenditure) in India

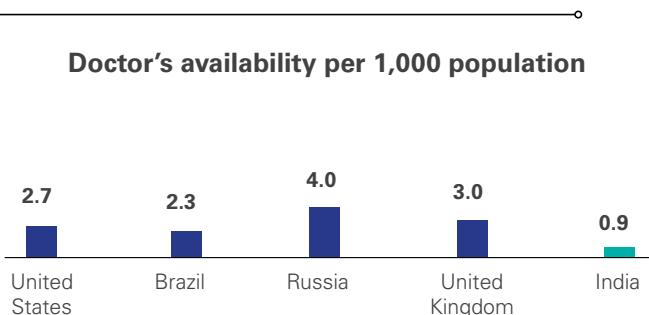
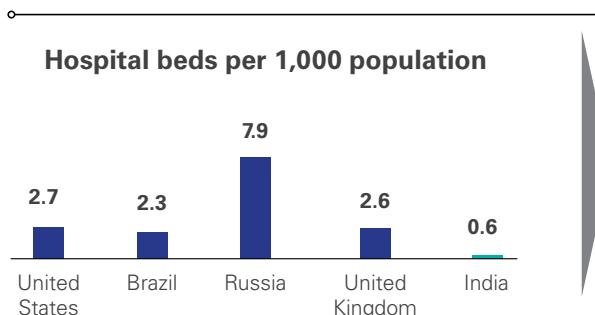


e. Dearth of healthcare infrastructure and resources:

The nation has been struggling with dearth of healthcare infrastructure for quite a while now. As of May 12, 2021, there were only 0.5 public hospital beds per 1,000 population and mere 1.4 beds, including public and private hospital beds per 1,000 persons in India which is abysmally low.² One of the most pressing problems in India remains a severe shortage of trained manpower in the healthcare sector, including doctors, nurses, paramedics and primary healthcare workers. The situation is further worsened in rural areas, where

nearly 66 per cent of India's population resides. Compared to global average of 2.5 doctors per 1,000 people, the doctor-to-patient ratio in India remains quite low, at 0.9 doctors per 1,000 people. Improving this situation continues to remain a long-term process as the government introduces various initiatives boosting healthcare education and training. As per Niti Aayog, India is gradually progressing on the path to have 1 doctor per 1,000 population by 2024, which is the WHO recommended doctor to population ratio.^{13,14}

Exhibit 5 and 6: Hospital beds per 1,000 population¹⁵ | Doctor's availability per 1,000 population¹⁵



10. "Out-of-pocket expenditure (% of current health expenditure)", World bank

11. "Out-of-pocket expenditure (% of current health expenditure) – India", World Bank

12. "International Health Care System Profiles - India", The Commonwealth Fund, June 5, 2020

13. "India is well on the path towards WHO recommended doctor to population ratio", DST, 2021

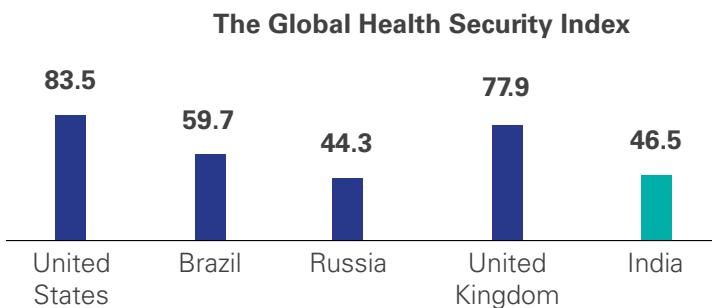
14. "5 reasons why India's healthcare system is struggling", The Hindu Businessline, 28 May 2021

15. EIU, Data tool

f. Lagging on Global Health Security Index: The Global Health Security Index (GHS) measures the state of health security/preparedness of countries across 6 parameters. While countries such as the US and UK fall on the higher end of the spectrum, it is estimated that 73 per cent of world's population lives in countries with a score of less than 50. Most countries lack foundational health system

capacities that are critical for an epidemic and pandemic response.¹⁶ The intent of such an index is to encourage improvements in the planning and response of countries to one of the world's most omnipresent risks—fectious disease outbreaks. The Covid-19 outbreak has served as a wake-up call to health organisations and governments around the world

Exhibit 7: The Global Health Security Index¹⁷



Parameters to measure the state of health security/preparedness of countries:

- a. Prevention
- b. Detection and reporting,
- c. Rapid response,
- d. Health system,
- e. Compliance with global norms
- f. Risk environment.

16. "2019 Global Health Security Index", GHS Index, 2019

17. "Ranked: Global Pandemic Preparedness by Country", Visual Capitalist, 20 March 2020





India's response against the Covid-19 pandemic

Despite the systemic issues in the health system, India responded to the Covid-19 outbreak almost immediately after the first few cases were reported. The Government of India (GoI) held the first Joint Monitoring Group meeting on 8th Jan 2020, to monitor the situation, assess preparedness, and narrow in on an appropriate response and health emergency management strategy. This included suspension of visa facilities, strengthen surveillance at international borders and reviewing capacities including disease surveillance, laboratory capacities, hospital preparedness etc.

A nation-wide lockdown was announced on 25th Mar 2020 to disrupt the pace of infection by restricting movement of citizens. The lockdown was instrumental in averting thousands of cases and deaths by breaking the chain of infection, and it also provided India with the opportunity to undertake augmentation of healthcare infrastructure to ensure availability of required isolation beds, ICU beds, ventilators, PPE kits, N-95.

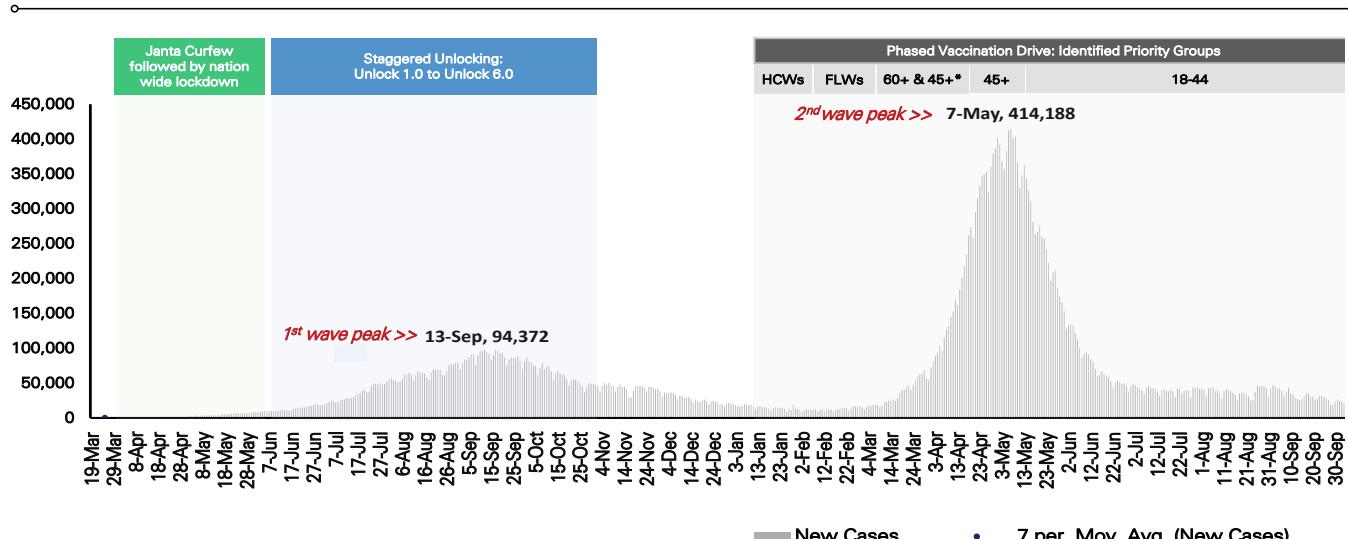
After a lockdown of 66 days, India finally undertook graded resumption of the economy through 6 unlock phases from 1st Jun 2020. However, this resumption in activities and mobility resulted in rise in cases, and the first wave of infection witnessed its peak on 17th Sept 2020, when 94,372 cases were reported in a single day. In order to tackle this challenge, the Government worked with a "whole of government and whole of society" approach, with crucial focus on four key aspects – Test, Track, Treat and Covid appropriate behavior.

Over the next few months, India's scientific research and medical community made rapid strides in the development of Covid-19 vaccine, and the country's response strategy saw another key weapon added to its arsenal – the kickoff of phased vaccination drive on 16th Jan 2021. However, this was also faced with certain roadblocks.

Second wave and subsequent response measures

India's vaccination drive was hit by disruptions due to a widening gap in demand and supply of vaccines. Faced with the challenge of catering to the vaccination demand spanning a country of 1.3 billion, State governments had to come to terms with issues in procurement of required number of doses under the liberalised vaccination policy. During the same period, India also experienced a steep rise in cases caused by new variants with higher transmissibility, a problem further compounded by covid fatigue and complacency. This was subsequently followed with a devastating second wave, with the infection spread peaking at 414,188 new cases on 7th May 2021. In order to face the second wave that overwhelmed India's healthcare systems, the Government devised a five-fold strategy of "Test-Track-Treat-Vaccinate-Covid Appropriate Behaviour" along with an emphasis on availability of adequate infrastructure in rural areas and boosting supply of medical oxygen and life-saving drugs to match the unanticipated surge in demand.

Exhibit 8: Timeline of new Covid-19 cases in India



2.3 Quick glance on the global and Indian Covid-19 scenario

Despite constraints and the enormity of the pandemic, India's approach and response managed the situation in a much effective manner. Although the challenges faced, especially in the second wave, were massive, some of the key strategies to prevent runaway spread of infection and fatalities included:

- Proactive response strategy amidst constraints:** India deployed a multi-sectorial management strategy and a robust institutional mechanism to keep its cases/million and deaths under control and reports some of the lowest numbers amongst the most affected countries including the developed world. Based on the cumulative Covid-19 cases recorded in past 18 months, India currently has 24,545 cases/million and 326 deaths/million.
- Effective clinical management leading to reduced fatalities:** With strong focus on clinical management protocols and parallel attention to monitor comorbidities, our fatality rate currently stands at 1.33 per cent. Furthermore, India is reporting a death per million of 326, which is significantly lower than that of the most top affected nations in the world.

- Significantly lower proportion of population affected:** USA, Brazil, Europe and Turkey are some of the most affected countries globally and their combined population is equivalent to total population of India. The analysis of 1.5 years of historical Covid-19 data shows that about 9 per cent of the total population of these has been infected as compared to India's 2.4 per cent and total deaths reported by the 4 geographies is 4.2 times more than India.
- Soaring rates of recovery:** Similarly, India has a recovery rate of almost 98 per cent, which is among the highest in the world. On the other hand, the recovery rates of developed nations with strong healthcare delivery systems such as USA (77 per cent) and United Kingdom (81 per cent) are well below the World Average of 90 per cent.
- Leveraging the past experience of mass vaccination to cover a large population size:** While India has managed to administer over 96 crore (960 million) doses as on 13 October 2021, almost 14 per cent of the total doses administered worldwide, the European Union stands at 9 per cent and USA at 6 per cent.

Exhibit 9: Comparison of spread of infection with respect to cases, deaths, population infected and vaccination status (as on 8 October 2021)

	Cumulative Cases/1M population	Cumulative Deaths/1M population	Percentage of population infected	Percentage of population vaccinated (1+ doses)	Population (in millions)
World	30,356	620			7,750
Brazil	100,246	2,792	10.0%	72.5%	214
Italy	77,649	2,173	7.8%	75.3%	60
Mexico	28,261	2,143	2.8%	50.4%	130
USA	134,297	2,173	13.4%	65.0%	333
UK	116,601	2,007	11.7%	73.3%	68
Spain	106,188	1,852	10.6%	81.2%	46
France	107,459	1,786	10.7%	77.8%	65
Russia	52,306	1,450	5.2%	33.2%	146
Germany	50,793	1,122	5.1%	68.3%	84
India	24,245	322	2.4%	48.4%	1,397



2.

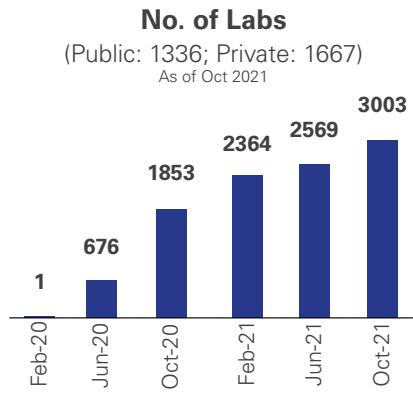
Key areas for intervention for Covid-19 pandemic management in India





Both the government and private players made several changes in the overall healthcare sector to ensure “readiness and resilience” of healthcare systems and prepare the country against Covid-19 pandemic:

Rapid healthcare infrastructure augmentation 	<p>Government efforts</p> <ul style="list-style-type: none"> The central government helped ensure availability of required funds and worked with various ministries, railways, Armed forces, National Disaster Management Authority (NDMA) and states to augment existing health facilities and help ensure establishment of make-shift health facilities for treatment of Covid cases of varying severity.¹ Several states and cities in India made significant efforts in developing Covid healthcare facilities with makeshift hospitals and converting hotels/ other facilities into covid care centres, e.g., Mumbai Jumbo Covid facility, Defense and Research Organization (DRDO) Covid facility in Delhi, etc. <p>Private participation – contributed specialized care facilities and medical expertise</p> <ul style="list-style-type: none"> Private hospitals have been the bedrock of capacity and capability with about 70 per cent of bed capacity and 60 per cent of inpatient care in India. In the wake of the pandemic, private hospitals have dedicated 40-80 per cent of their bed capacity for treating Covid-19 patients.² Private sector hospitals not only reserved beds for Covid-19 patients, but also operated , in many states and cities, at prescribed package rates to provide care at reasonable cost. Private hospitals across states worked with hotels, banquet halls and government health facilities to convert such facilities into covid care centres. For e.g., the Calcutta Police Hospital, in collaboration with Medica Super Specialty Hospital was turned into a 300-bed Covid hospital.
Augmenting testing capacity 	<p>Government efforts</p> <ul style="list-style-type: none"> MoHFW, Indian Council for Medical Research (ICMR), Council of Scientificand Industrial Research (CSIR), Department of Biotechnology (DBT), DRDO and various other central and state government bodies worked in tandem to ensure continuous augmentation of Covid-19 testing facilities across India. The number of testing laboratories has reached from just one in February 2020 to 3003 labs in October 2021.³ As of August 2021, India was conducting approximately 17 lakhs (1.7 million) tests per day and has the capacity to expand testing rates as per demand.⁴ <p>Private participation to boost testing capacity across India</p> <ul style="list-style-type: none"> Numerous private labs got expedited approval resulting in upsurge in numbers of testing. Private players operated at capped rates for reverse transcription-polymerase chain reaction (RT-PCR) tests and contributed to 45 per cent of the Covid-19 testing capacity in India.⁵ Private labs got expedited approval resulting in upsurge in number of testing and contribute to 55 per cent of the total RT-PCR labs in India. A multinational medtech company launched Covid-19 home test kits priced at less than INR 325.⁶ Indigenisation of diagnostics programme was started by Centre for Cellular and Molecular Platforms supported by Rockefeller Foundation under which a leading Indian IT company developed a marketplace platform to connect kit buyers with manufacturers.⁷



1. Upgradation of Healthcare System for Effective Management of COVID-19, Press Bureau of India, 27 July 2021
 2. Private sector supports government in targeted vaccination against COVID-19, BioSpectrum, 13 October 2021
 3. Covid-19 Testing Labs, ICMR, October 2021

4. India achieves milestone of 50 crores COVID-19 Sample Testing, ICMR, August 2021
 5. Daily Covid Bulletin from PIB”, November 2020
 6. Covid-19 home test kit in India article, Times of India, 12 July 2021
 7. “Initiative makes govt-approved testing kits available online,” Times of India, 23 April 2021



Provision of adequate medical supplies



Government efforts

- **Helping ensure availability of critical supplies**, MoHFW and ICMR availed the services of the Ministry of Civil Aviation and their airline partners in both the government and private sector under 'Mission Lifeline Udan' to deliver consignments of Covid-19 diagnostic material, drugs and essential medical supplies across the country.
- **Manufacturing capacity of Remdesivir was augmented** from 38 lakh (3.8 million) vials per month to nearly 119 lakh (11.9 million) vials per month. In addition, manufacturing sites were increased from 22 to 62 by expedited approval.⁸
- **Availability of Liposomal Amphotericin-B** was increased by requesting the existing five manufacturers to increase the production, while six additional firms were given permission.⁹
- **Smooth supply of Covid-19 drugs** by establishing of Covid Drugs Management Cell (CDMC) and Drugs Coordination Committee (DCC) in Department of Pharmaceuticals (DoP).

Private participation for increased production capacity

- **Private pharmaceutical companies increased production capacity** by manifold of essential drugs like Remdesivir, Liposomal Amphotericin-B and other required drugs for Covid-19 treatment.
- **Domestic production capacity of Personal Protective Equipment kits (PPEs)** was increased with private sector and government supported players to 2,00,000/day (May 2020) from 6,000-7,000/day (April 2020).¹⁰
- Andhra Pradesh Medtech Zone (AMTZ) produced over 15,000 ventilators, 10 million Covid diagnostic kits, 500,000 N-95 masks and 200,000 PPEs.¹¹
- Project SAANS, a collaborative effort between ICMR and a leading Indian pharma company, focused on developing high quality, affordable and re-usable face mask. The first batch of 100,000 masks was then distributed in rural areas free of cost.¹²
- In collaboration with Ministry of Textiles, a leading mining company imported 23 PPE machines and partnered up with authorized apparel manufacturers to produce up to 5,000 PPEs in a day.¹³



8. Swift actions taken by Government to enhance availability of Remdesivir in India, PIB, 17 May 2021
 9. Five pharmaceutical companies get approval to make black fungus drug, Business Standard, May 2021
 10. India's successful journey to self-sufficiency in PPE kits. Economic Times, 14 October 2020

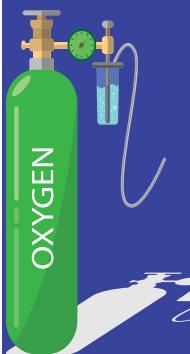
11. Investment Opportunities in India's Healthcare Sector, Niti Aayog, March 2021
 12. Pharma company Annual Report, 2021
 13. "Vedanta starts mass production of Personal Protective Equipment in Gurugram," Economic Times, 30 April 2020



Government efforts

- About 15 per cent oxygen supply in India is consumed by healthcare facilities, and rest is for industrial use. But after second wave, nearly 90 per cent of nation's oxygen supply – 7,500 MT (metric tonnes) started getting diverted for medical use daily.¹⁴
- **Significant policy level changes** were made to facilitate swift expansion of Oxygen Supply across the nation. The Ministry of Home Affairs (MHA) issued orders to limit industrial use of liquid oxygen and restrictions on inter and intra-state movement of persons/ goods, National Pharmaceutical Pricing Authority (NPPA) brought Liquid Medical Oxygen (LMO) under price control and DCGI (Drugs Controller General of India) allowed the license to manufacture LMO to existing industrial oxygen plants.
- **Nationwide installation of about 1,500 Pressure Swing Adsorption (PSA)** plants under various sources including Foreign Aid, Central Ministries, DRDO and PM CARES Fund is underway.¹⁵
- **Supplementary support** in the form of foreign aids was received from countries such as the US, UK, Switzerland, Russia, Australia, Canada, Mauritius, France and the EU.¹⁶ Initiatives such as 'Oxygen express', 'Project O2 for India', geographically distributed emergency reserve storage points were implemented to overcome logistical issues and tackle the supply demand mismatch.

Increasing oxygen supply



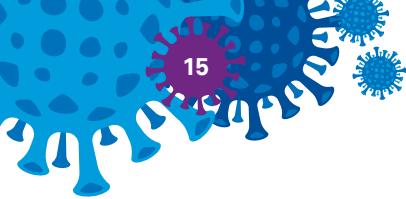
Private participation to boost oxygen supply

- **Companies entered into collaborative partnerships** with AMTZ to set up systems such as the *O2Home: Pan India Affordable Oxygen Concentrator Rental Program*.¹⁷
- **Global pharma player extended support by donating oxygen generator plants** to assist states of Maharashtra, Madhya Pradesh and Gujarat, where the respective State governments distributed the oxygen produced at these plants to Government hospitals and health facilities.¹⁸
- A leading multinational pharma company provided oxygen concentrators and high flow nasal cannulas across Covid dedicated facilities in Bengaluru, Indore, Kurkumbh and Patalganga.¹⁹
- Indian conglomerates diverted industrial oxygen from their plants to hospitals across the country²⁰ and several tech startups joined hands to manufacture oxygen concentrators, to meet the immediate need of patients and reduce dependency on imports.²¹



14. "Preventing a Repeat of the COVID-19 Second-Wave Oxygen Crisis in India", Observer Research Foundation, 25 June 2021
 15. "PM reviews oxygen availability as govt looks to set up 1,500 PSA plants" Hindustan Times, July 10, 2021
 16. "Here's the full list of foreign medical aid that have reached India till now and where they are headed", Money Control, 12 May 2021
 17. "Cab company partners with AMTZ to provide on-demand oxygen concentrators in 12 cities", Uber Newsroom, 21 June 2021

18. Pharma company donates Oxygen generation plants in Maharashtra, MP & Gujarat to aid COVID-19 relief efforts, Lupin, 11 June 2021
 19. Pharma company Annual Report, 2021
 20. "India oxygen crisis: Tata Group donates cryogenic containers", gasworld, 21 April 2021
 21. "Indian tech cos join hands to make open source-based oxygen concentrators", YourStory



Increasing the pace of Covid-19 vaccination



Government efforts

- India's vaccination drive has picked up pace tremendously since the "Revised Guidelines for Implementation of National Covid Vaccination Program" came into effect on 21st Jun 2021 allowing manufacturers to supply up to 25 per cent of monthly production to private hospitals and the rest 75 per cent to the Central government.
- As on 19 October, about 98 crores (980 million) doses have been administered and on 17th September India set a world record by administering close to 2.5 crore (25 million) doses within 24 hours.²² With three vaccines released so far - Sputnik V and domestically produced Covaxin and Covishield, indigenously created three-dose DNA vaccine, Zycov-D, is expected to be a part of the vaccination drive soon.
- Indian Immunologicals Limited (IIL) and Bharat Immunologicals and Biologicals Corporation (BIBCOL) entered into technology transfer agreements with Bharat Biotech to produce the vaccine locally, thus providing a boost to the vaccine supply.²³

Private participation to accelerate pace of vaccination

- GoI invited participation of private companies to accelerate vaccination efforts and leading healthcare brands launched their own Covid-19 vaccination drives with the help of partner retailers, doctors and pharma supply chain facilities to facilitate last-mile delivery of cold chain products.²⁴
- Leading health benefits platform collaborated with a major integrated healthcare company to carry out on-site Covid-19 vaccination drives and medical assistance in 500+ companies.²⁵
- Philanthropic arm of a leading beverage company partnered with non-government organisation (NGO), Sustainable Environment and Ecological Development Society (SEEDS) to provide 1,00,000 vaccine doses to communities and provided 100 oxygen concentrators to the Centre.²⁶



22. Over 95.96 crore Covid vaccine doses given to states, UTs so far, health ministry says, The Print, 12 October 2021
23. "Two PSUs enter into pact with Covaxin maker Bharat Biotech to produce Covid vaccines", Times Now, 13 May 2021
24. Online pharmacy launches COVID-19 Vaccination Registration Drive, Pharmeasy
25. ekinicare, 1mg to hold COVID-19 vaccination drives in 500+ corporate, Biospectrum, 20 April 2021
26. PepsiCo Foundation partners with SEEDS to launch community vaccination drives in India, PepsiCo website, May 2021



Implementation of digital health initiatives



Government efforts: Throughout the Covid response strategy, India focused on incorporating digital initiatives

- **E-Sanjeevani telemedicine platform:** To ensure continuation of healthcare service delivery despite restricted movement. With over 420 online Outpatient Departments (OPDs), the platform hosts both specialty and super-specialty OPDs, one crore free (10 million) consultations have been provided through the platform (as of August 2021).²⁷
- **CoWIN:** To ensure end-to-end management of vaccine supply chain and beneficiaries and keep track of the overall vaccination drive.
- **Aarogya Setu (contact tracing application):** To collect and track information that helps notify users whether they have been exposed to Covid-19, by checking their proximity to known patients.
- **ITIHAS (IT-enabled Integrated Hotspot Analysis System):** For surveillance and containment strategies, in addition to manual contact tracing.

Private participation to increase digitisation

- “**Swasth Alliance**” is a not-for-profit alliance including 150+ healthcare organisations such as hospitals, NGOs, insurers, technology aggregators, and others to empower the inclusion of digital technologies.²⁸
- Several private hospitals launched remote care packages for Covid-19 patients undergoing home isolation, which included remote monitoring by nurses and doctors and medical care kits for close monitoring of patients’ conditions.²⁹
- Over 100 private players were given the approval for integration of their portals or apps with the CoWIN API, which enabled the users to search for vaccines and book the slots at platforms other than CoWIN. This was to enhance the prospects of bigger participation in vaccination drives and fast-track the national immunisation drives.³⁰
- Several key private companies aided the national Covid-19 vaccination efforts by developing and rolling out Covid-19 vaccine finder tools to help citizens look for the availability of slots for Covid-19 vaccines to eliminate roadblocks in the process of slot booking.³¹

27. PIB Delhi”, Ministry of Health and Family Welfare, August 24, 2021
28. “Weforum.org”, Swasth Alliance Ecosystem Initiative
29. Private hospitals offer remote monitoring, care at home for Covid-19 patients, Hindustan Times, 9 June 2021

30. More apps may be added to CoWIN to boost vaccination, mint, 8 September 2021
31. Digital payment system company adds new real-time discovery, slot booking features to its Covid-19 vaccine finder tool after Govt revises CoWIN API guidelines, Financial Express, 11 May 2021



Developing capacity building platforms



Government efforts

- Various efforts from mock drills for Covid-19 preparedness to orientation of medical staff through Integrated Government Online Training (iGOT) platform were undertaken to support capacity building of healthcare workforce and frontline workers. About 7,600 participants at state-level and 61,500 participants at district-level have been trained so far. Additionally, more than 2 lakh (0.2 million) vaccinators and 3.9 lakh (0.39 million) other vaccination team members have been trained on the process to be followed at the vaccination sites through the digital platform.
- Centre of Excellence (COE) initiative under the aegis of All India Institute of Medical Sciences (AIIMS), New Delhi was started with an aim to ensure continuous knowledge sharing through a series of webinars held with Regional and State COEs.

Private participation to upskill healthcare workers

- Project ECHO (Extension for Community Healthcare Outcomes), a web-based portal used to impart specialized training through a hub and spoke model, run by an Indian pharma company was set up at various health institutions to enable connectivity of medical workforce to a Covid-19 knowledge management network. With 54 hubs and 318,000 spokes, almost 400,000 healthcare workers have been trained through the platform as on 23 September 2020. This initiative was facilitated by AIIMS and ICMR.³²

Effective Information, Education and Communication (IEC) and risk communication



Government efforts:

- The Government of India leveraged active community engagement and deployed a “people centric” IEC and risk communication strategy to turn the fight against Covid into a “people driven movement”. The following measures were taken under India’s risk communication and community engagement strategy:
 - Continuous and transparent flow of information on evolving situation of Covid-19
 - Provision of reliable sources for information, information about simple public health preventive measures, need for early healthcare seeking, and addressal of fake news
 - Utilisation of all conceivable channels of communication
 - Wide dissemination of communication material, prepared after expert consultation and community need assessment (pre-caller tunes and caller tune messages reached across 1.17 billion mobile telephone connections in regional languages)

Private participation from various stakeholders for focused communication

- NGOs such as CRY, Magic Bus etc. have been involved in creating on-ground awareness by sensitizing communities regarding Covid-19 and the prevention measures to be followed such as proper use of masks, hand hygiene, physical distancing etc.
- Various fashion, food delivery and feminine hygiene brands are utilizing their online presence to initiate conversations regarding Covid-19 vaccination and ensuring relevant and time sensitive communication.³³

32. "ECHO India Goes Viral in Response to COVID-19," The ECHO Effect, 23 September 2020

33. "Brands promote vaccination drive through digital campaigns," LiveMint, 5 May 2021



Financial assistance to aid pandemic management



Government efforts

- The government released nearly INR15,000 crore (US\$2 billion) under the Emergency Response and Health System Preparedness Package (ECRP-I) to all States in April 2021.
- ECRP-II package, amounting to INR23,123 crore (US\$3.1 billion) was announced on 8th July 2021 to ensure implementation of critical activities from July 2021 to March 2022:
 - Establishment of dedicated Paediatric Care Unit in all 736 districts along with CoEs in each state
 - Increase of availability of ICU beds including 20 per cent Paediatric ICU beds
 - Strengthening tele-consultation platform and Hospital Management Information System (HMIS)

Private participation to boost financial assistance

- 34 Indian entrepreneurs and 44 venture capital funds have formed Action Covid-19 Team (ACT) wherein a grant of INR100 crore (~US\$13 million) is to be provided to innovators working on solutions to control Covid-19.³⁴
- ACT in phase one was able to fund 54 startups and over 100 projects, impacting 49 million lives across 27 states including Pune-based MyLab, that secured INR1 crore (US\$132,500) to create an RT-PCR kit, manufactured domestically, which is approved by ICMR.
- ACT is further looking to put together a INR500 crore (~US\$67 million) corpus to fund solutions to problems in education, healthcare, environment, and gender diversity.



33. "Action COVID-19 Team (ACT) sets up INR 100 crore grant to support innovative Indian startups", Invest India, 8 April 2020

3.

Learning the lessons of Covid-19 pandemic in India: steps toward building resilient health system





Financing for "Healthy India"



1. Immediate need to increase public health spending on healthcare
2. Preparing for Dual Disease Burden with increasing population
3. Mandatory Healthcare Coverage for all
4. Fostering innovative financing models
5. Health Maintenance Organizations (HMO Models) for population health management

Health system strengthening



1. National Health System Maturity Index for states and districts
2. Model health districts programme - connecting the dots
3. Leverage make-shift and alternative healthcare infrastructure models
4. Strengthen primary care system with private sector
5. Ensure adequate diagnostic services in every district

Robust public health crises management



1. National surveillance and pandemic management system
2. Public health observatories and health emergency observation centres
3. Population health management and registry

Future health workforce



1. National Healthcare Professionals Skilling Platform
2. National Digital Health Literacy Program to prepare for digital health ecosystem
3. Healthcare skilling centre across districts to build India as healthcare skill capital of the world

Private sector participation and support



1. Revive strategic purchasing and PPPs
2. Healthcare Infrastructure Development Fund
3. Driving transparency in healthcare
4. Simplify regulatory compliance, maximize governance system

Embedding digital health to bridge systemic gaps



1. Health UID, beyond UID Number
2. Incentivize providers for digitisation
3. Promoting open-source digital health solutions
4. Uberisation of referral transport system
5. National Swasth Citizen app
6. National strategy to promote telemedicine and virtual care



Financing for “Healthy India”

1. Immediate need to increase public health spending on healthcare

According to World Health Organisation (WHO), India ranks 184th out of 191 in terms of per cent of GDP spent on healthcare. Average healthcare spend per person in India, is one of the lowest compared to other countries such as Sri Lanka, China, and Thailand as they invest three to four times more per capita on healthcare. The Economic Survey on India 2020-21 has strongly recommended an increase in public spending on healthcare services from 1.0 per cent to 2.5-3.0 per cent of GDP, as envisaged in the National Health Policy (NHP) 2017. Thus, India announced in February 2021 that it will increase the public spend on healthcare to 2.5 per cent of GDP by 2024–25.¹

The Covid-19 pandemic crisis is a reminder of the importance of investing in the healthcare sector for a country like India. A robust healthcare system drives GDP growth in the presence of adequate investments and a conducive environment by not only acting as a productivity and employment generator, but also as a magnet to attract foreign exchange earnings and provide opportunities for innovation and entrepreneurship. As per WHO, India, Nigeria and the Philippines, where more than half of health financing comes out-of-pocket, are projected to undergo a more than 5 per cent contraction in per capita GDP.² Approximately 60 million citizens have already been pushed below the poverty line for reasons such as these.³ Hence there is a need for a clear roadmap to enhance budgetary spending on healthcare in the next 2 to 3 years, which will be critical for building a resilient health system.

Larger countries expanding healthcare vision

- Current levels of healthcare spending in the UK—both on a per-person basis and as a share of GDP—is amongst the highest globally. In 2021, the government set plans to tackle the Covid backlog, reform adult social care, and bring the health and social care system closer together on a long term, sustainable footing. It plans to invest US\$49 billion (GBP36 billion) in the healthcare system over the next three years.⁴
- From April 2022, the government will introduce a new, UK-wide 1.25 per cent Health and Social Care Levy, ringfenced for health and social care. This will be based on National Insurance Contributions (NICs) and from 2023 will be legislatively separate.

To ensure everyone contributes fairly, all working adults, including those over the state pension age, will pay the levy and the rates of dividend tax will also increase by 1.25 per cent to help fund this package.



2. Preparing for Dual Disease Burden with increasing population

In the coming years, India is expected to overtake China as the most populous country and its bulge in the working-age population is going to last till 2055. However, share of senior citizens in India will double from 8.6 per cent in 2011 to 16 per cent by 2041. In 2050, India is expected to have 300 million senior citizens.⁵ With this, the burden of disease, especially from non-communicable diseases (NCDs) will further

put strain on the healthcare system, considering nearly 5.8 million people already die from NCDs (heart and lung diseases, stroke, cancer and diabetes) every year.⁶ India currently has around 60 million diabetics, a number that is expected to swell to 90 million by 2025. The rising NCD burden is estimated to cost India US\$4.58 trillion before 2030.⁷

To cater to a burgeoning number of people requiring healthcare services for communicable and non-communicable diseases, it is expected that India would need a strong medical workforce of 7.4 million

1. Budget 2021: ‘Increase healthcare expenditure from 1.2% to 2.5% of GDP’, Business Today, 2021
 2. Global spending on health: Weathering the storm, WHO, 2020
 3. “Financing Healthcare for all in India: Towards a Common Goal”, May 2015, Oxfam India
 4. “Record £36 billion investment to reform NHS and Social Care”, NHS, 7 September 2021

5. “Investment opportunities in India’s healthcare sector”, Niti Aayog, 2021
 6. “Non-communicable Diseases”, National Health Profile
 7. “Investment opportunities in India’s healthcare sector”, Niti Aayog, 2021



by 2022, with at least 550 new medical colleges to come at par with the global average of doctors in 2030.⁸ Unless acted upon immediately, India will run out of time to harness the potential of its youth to drive economic growth and as well as adequately plan

for a large geriatric population to be housed by 2050. This is likely to create significant fiscal challenges for the government to deliver adequate physical infrastructure, invest in education and healthcare, and create a sustainable social environment.

Health policy in Japan – current situation and future challenges⁹

- Japan is aging rapidly, those over 65 already constituted 27.7 per cent of the total population in 2017. This figure is the highest in the world and is projected to grow continuously up to 38.4 per cent in 2065. With an increasing in-need population and declining tax contributors, Japan government is bound to face severe challenge of sustaining the social infrastructure including social security (medical insurance and pension) and other essential services such as transportation and response capacity to natural disasters.



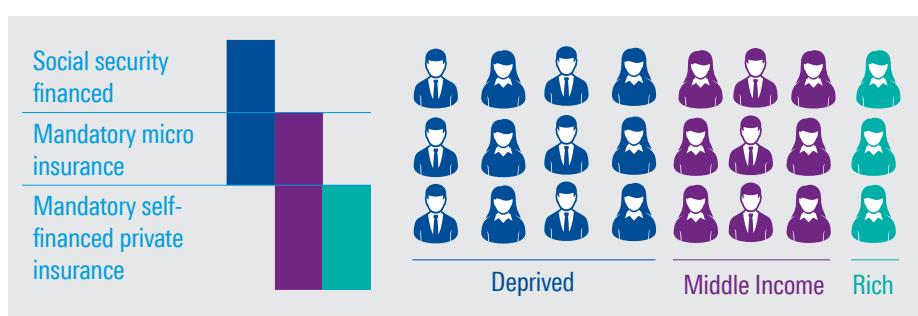
3. Mandatory Healthcare Coverage for all

When illnesses such as Covid-19 hit rural households, their ability to work and earn is impacted, leading to fall in savings and often, loss of livelihoods, at the same time increasing their health expenses. According to an estimate, over 60 per cent of the rural households with hospitalised cases borrow, sell their assets (including gold) or rely on contributions from friends and relatives to pay for inpatient care.¹⁰ This becomes crucial considering the ongoing Covid-19 crisis which has compounded financial burden by increasing health expenses across the country drastically. KPMG in India report named "Mandatory Health Insurance - A step towards Universal Health Coverage" released in 2016 and Niti Aayog report titled "Health System for a New India: Building Blocks" released in 2019, outlined need of Mandatory Healthcare Coverage of standard basic benefits as the basis for all health insurance coverage in India.

Extensive efforts have been made by the government towards achieving universal healthcare coverage, however one of the critical aspects towards the goal is that certain parts of the population still remain uncovered. Now, with this bottom proportion of the country's economic strata covered with Ayushman Bharat - Pradhan Mantri Jan Arogya

Yojana (AB-PMJAY) and the higher income group already capable of bearing their medical expenditures, India's health coverage strategy needs to focus on significant part of the population – the middle class. A well-rounded financing strategy, woven around making the health insurance mandatory could be a way forward. India needs to develop financing model with risk pooling ranging from fully financed for economically weaker sections, co-payment model for middle income group and self-financed model for higher income group to ensure mandatory healthcare coverage based on the economic strata. India needs a system to link healthcare coverage (Government healthcare coverage, EHS or self-financed) of every individual to Health UID with facility to top-up and avail other value-added benefits as per an individual need.

Exhibit 10: Identification of individual's healthcare insurance coverage through UIDs



8. Economics of Non-Communicable Diseases in India, World Economic Forum, November 2014

9. Population aging in Japan: policy transformation, sustainable development goals, universal health coverage, and social determinants of health, Global Health and Medicine Journal, 31 October 2019

10. "Rural demand to remain muted", 27th May 2021, Livemint

Mandatory car insurance: similar rationale¹¹

- Under the Motor Vehicles Act of 1988, all vehicles in India are required to have a car insurance policy of a minimum coverage amount. This form of compulsory insurance helps in spreading the cost of premium and mitigating risk. The premium paid by an individual contributes to coverage for another individual who gets involved in an accident. The idea behind making car insurance compulsory is to keep the insurance premium within reach of all individuals. This system not only ensures that the insured individual is protected from unforeseen expenditure, but also the premium paid prevents the cost of insurance from rising.



4. Fostering innovative financing models

It is estimated that it will cost US\$3.9 trillion a year to achieve the Sustainable Development Goals (SDGs)¹² in developing countries alone. Current levels of both public and private funding cover only US\$1.4 trillion, leaving an estimated US\$2.5 trillion annual gap. Filling this gap will require tapping new and greater sources of capital from the public and private sectors, including the more than US\$200 trillion in the capital markets, and effectively deploying these funds towards development efforts.¹³ Innovative finance relies on partnerships to pool resources from a range of public and private sources to solve problems faster, more effectively, and at a larger scale than would be possible alone. Growing interest in innovative finance is being

fueled by two key trends: innovative financing for development and impact investing.

For the healthcare sector, innovative and blended finance has potential to play instrumental role in the way we solve society's greatest health challenges. The healthcare sector has plentiful, immediate prospects to leverage innovative financing to bridge the financing needs for building resilient health system. India is yet to fully explore and leverage innovative financing models. A systematic effort led by the government along with private and other potential financing sources will be critical in creating and adopting innovative financing models in the coming times.

Utkrisht Development Impact Bond (DIB): blended finance in healthcare¹⁴

- The Utkrisht DIB aims to reduce maternal and newborn deaths by using a pay-for-success model where a private investor fronts the cost of an intervention. In this case, the UBS Optimus Foundation will provide initial working capital to the service providers, namely, Population Services International and Hindustan Latex Family Planning Promotion Trust. This, in turn, will help the two organisations to work with private healthcare facilities in Rajasthan to improve the standard of quality and care. The results of the intervention will be measured by clear, predetermined metrics (i.e., reduction in maternal and newborn deaths). Finally, if the intervention achieves pre-agreed outcomes, an outcome funder—in this case United States Agency for International Development (USAID) and 'MSD for Mothers'—repays the investor and provides a return on the investment. If outcomes are not achieved, the investor generally stands to lose not only the potential returns but also the principal. From the outcome funder's perspective, money is disbursed only against documented results. This transaction also involves the role of the government of Rajasthan, which participates in the oversight of the impact bond. If the programme is successful, the Rajasthan government will likely become the outcome funder for the next phase of interventions.



11. Mandatory Health Insurance - A step towards Universal Health Coverage, July 2016, KPMG India

12. The Sustainable Development Goals Report, Intergovernmental organization report, 2020

13. World Investment Report- International Production Beyond the Pandemic, UNCTAD, 2020

14. " How blended finance can support India's COVID-19 recovery", 21 July 2021, Convergence



5. Health Maintenance Organizations (HMO Models) for population health management

A less discussed and explored concept in India is HMO. Way back in 2017, Niti Aayog key health members explored concept of HMO for piloting in few districts. HMO plans offer a gamut of healthcare services through a specific network of provider physicians and hospitals. An individual can choose preferred HMO and different plans as per the needs. As a member of an HMO, an individual needs to

choose a primary care physician who will provide most of healthcare needs and refer an individual to an HMO specialist and provider as and when needed.

In exchange for getting care through a limited network and seeing a specialist only if your primary care physician refers you, an individual can save money on premiums, deductibles, copayments, and coinsurance. Healthcare services obtained outside of the HMO are typically not covered, though there may be exceptions in the case of an emergency.

Health Maintenance Organization (HMO) in Israel offering uniform benefits package¹⁵

- Israel has one of the most progressive systems for primary care, ably facilitated by their Health Maintenance Organisations. The 1995 Act made membership of one of the four existing HMOs – Clalit, Maccabi, Leumit and Meuhedet – compulsory, although citizens can choose which one to join, the law determined a uniform benefits package available to all irrespective of age or health status. This insurance-based system is financed with earmarked taxes and contributions paid out of salaries at a progressive rate, supplemented by state funding. Premiums are collected by the National Insurance Institute and are transferred to the four non-government, not-for-profit HMOs based on a capitation formula, who purchase and provide services. Citizens can top-up their mandatory insurance by paying a premium to access additional services from the HMO or buying private insurance.



15. Ayushman Bharat: A big leap towards universal healthcare coverage, KPMG, December 2019

Health system strengthening

1. National Health Maturity Index for states and districts

The Covid pandemic has highlighted the gaps in the preparedness of healthcare infrastructure in the country and lack of visibility of ready reckoner to understand the vulnerable districts and geographies with higher health risks, higher disease burden, deficit of healthcare infrastructure and resources that needed priority-based interventions. The lack of visibility of healthcare resources across 730 plus districts became detrimental in the initial days of Covid-19 pandemic in India. NITI Aayog has developed State Health Index since 2017 and District Hospital Index to assess the performance of states/UTs and district hospitals on various parameters. However, the current Index provides post-facto and limited indicators

to understand the health system maturity and preparedness at facility level across public and private sector. For further management of health emergent situations like Covid, it is pertinent to highlight that country needs a National Health System Maturity Index for each district that shall provide complete visibility of health profile of a district, health facilities' preparedness, availability of healthcare resources and logistics system. Such index will enable understanding of preparedness and required interventions from top to last mile equipping prompt response and identification of vulnerable pockets. National Health System Maturity Index shall act as decision support system to understand current health system gaps and devise required health system strengthening interventions from top to healthcare facility level at block level.

Global Health Security Index¹⁶

- The Global Health Security (GHS) Index is the first comprehensive assessment and benchmarking of health security and related capabilities across the 195 countries that make up the States Parties to the International Health Regulations (IHR [2005]). The GHS Index is a project of the Nuclear Threat Initiative (NTI) and the Johns Hopkins Centre for Health Security (JHU) and was developed with The Economist Intelligence Unit (EIU). The GHS Index assesses countries' health security and capabilities across six categories, 34 indicators, and 85 sub-indicators. The findings are drawn from open-source information that answered 140 questions across the categories.



16. Mandatory Health Insurance - A step towards Universal Health Coverage, July 2016, KPMG India





2. Model Health District Mission – connecting the dots

India needs focused systematic and phased approach to augment health system infrastructure across 730 plus districts. In a phased and mission mode approach, 100 to 150 districts per year should be taken up to develop as model health districts. The model health districts will be integrated attempt towards addressing the systemic issues pertaining to accessibility of care, affordability, and universality. Further, the model proposes to serve other key objectives of increasing

financing, augmenting health infrastructure and medical technology, improving operations, enhancing referral network, enhancing community engagement, augmenting community health surveillance, improving healthcare workforce capacities, leveraging digital health innovations and mitigating shortage of doctors and human resources. Under such model health districts, model district hospitals, Primary Health Centres (PHCs), and Community Health Centres (CHCs) shall be developed with focused interventions to augment overall infrastructure, operations and quality of service.

Aspirational Districts Programme¹⁷

- Launched by the PM in January 2018, the Aspirational Districts programme aims to quickly and effectively transform 112 most under-developed districts across the country. The broad contours of the programme are Convergence (of central and state schemes), Collaboration (of central, state level 'Prabhari' Officers and District Collectors), and Competition among districts through monthly delta ranking; all driven by a mass movement. With States as the main drivers, this program focuses on the strength of each district, identifying low-hanging fruits for immediate improvement and measuring progress by ranking districts on a monthly basis. The ranking is based on the incremental progress made across 49 Key Performance Indicators (KPIs) under 5 broad socio-economic themes - Health and Nutrition, Education, Agriculture and Water Resources, Financial Inclusion and Skill Development and Infrastructure.

3. Leverage make-shift and alternative healthcare infrastructure

Covid-19 pandemic has showed Indian healthcare providers unforeseen ways of rapidly developing make-shift hospitals, alternative healthcare settings and augmentation of healthcare infrastructure to respond to healthcare crises and high surge in the

demand. India with huge shortage of healthcare infrastructure across geographies and limited finances, should continue to explore make-shift hospital and alternative healthcare infrastructure models to bridge the gap of bed shortage with cost effective model. A focus on creating healthcare services beyond hard physical infrastructure could be effective and tested model for the country like India.

Temporary Covid centres/hospitals in Delhi¹⁸ and Jumbo hospitals in Mumbai

- On July 5, 2020, DRDO along with MHA, MoHFW, the Armed Forces, an Indian conglomerate, manufacturer of automobiles and airplanes along with other industry players built 1000-bed temporary Covid hospital in around 12 days. The facility was extensively equipped with ICU facilities with 250 beds, monitoring equipment and ventilators. In this facility, the Covid patients who were referred by the district administration were admitted and treated free of cost while critical cases were referred to AIIMS, New Delhi.¹⁹
- In June 2021, a new 2,170-bed Jumbo Covid Hospital was built in Mumbai in just 35 days which included oxygen beds comprising of 70 per cent of total beds, a 384-bed isolation room, 42 ICU beds for children, 20 beds in the dialysis unit, a 40-bed triage, among other facilities.²⁰

17. Aspirational Districts Programme, Niti Aayog website, October 2021
18. "DRDO builds 1000-bed temporary Covid hospital in 12 days", A Monthly Bulletin of Defence Research and Development Organisation, August 2020

19. "Makeshift Hospitals, Lockdown & Graded Action Plan: How Delhi is Preparing For 3rd Wave of Covid | Know it all", India.com, August 23, 2021
20. "Mumbai's New 2,170-Bed Jumbo Covid Facility Built In Just 35 Days", NDTV, June 28, 2021



4. Strengthen primary care system with private sector

The Government of India aims to strengthen Comprehensive Primary Healthcare (CPHC) that is universal, free, and closer to community through converting 150,000 existing Sub Health Centres (SHCs) and Public Health Centres (PHCs) into Health and Wellness Centres (HWCs) under Ayushman Bharat. Despite the disruptions caused by Covid-19, 70,000 HWCs have been successfully operationalised from 31st March 2021 through collective efforts

of Central and State Governments.²¹ For swift and systematic set up of health and wellness centres and to uplift primary care systems, it is important to leverage the expertise of private sector through PPPs with State Governments. It is vital to develop network of private primary care clinics/ GP clinic as part of AB-HWCs to ensure CPHC that is universal, free, and closer to community. Various state governments have evaluated PPP models with NGOs and private providers in the recent past and need further focused approach to strengthen primary care network in the country.

Setting up of 550 digital clinics in Madhya Pradesh²²

National Health Mission Madhya Pradesh, will set up telemedicine enabled 550 digital clinics at Public Health Centres (PHCs) across the state, equipped with digital infrastructure and other facilities and aims to serve mostly rural population of close to 13.75 million through these digital clinics.

Digital dispensaries set up by Apollo TeleHealth in Jharkhand²³

Apollo TeleHealth set up digital dispensaries (telemedicine systems) in 100 selected PHCs in Jharkhand and intends to benefit a total of 2 million beneficiaries by providing access to general practitioners as well as medical specialists at the doorstep of common people in villages across the State.

5. Ensuring adequate diagnostic services in every district

Amidst Covid pandemic, the need for the diagnostic facilities increased manifold and though testing capacity has been increased by efforts of government, it appeared inadequate to deal with the spiraling demand. It was found that during the second wave, nearly 46 per cent of the districts lacked government run RT-PCR labs and nearly 41 per cent of the districts were devoid of both government and private labs.²⁴ This resulted in an enormous backlog of testing, thereby impacting the pandemic management. Majority of the diagnostic laboratories in the country cater to the metros and tier I cities, creating a major lacuna in the rural areas.

Along with the focus on ensuring adequate hospitals across the country, the government should also ensure availability of diagnostic facilities like pathology laboratory, radiology and imaging services with required trained human resources. However, the challenge lies in ensuring access of diagnostic services to the last mile. This is where public private partnerships can be leveraged. Swiftly becoming a suitable mode of health service delivery across the country, PPP models are proving successful in enabling access to improved quality of care at affordable costs, with the government and private players working together to deliver better results.

Jharkhand state government²⁵

Jharkhand state government has been leveraging the PPP model for providing radiology and pathology services, with big private players in diagnostic space. Radio-imaging services were set up in all 24 district hospitals and three medical colleges through a PPP. IFC assisted the state in successfully structuring a 'Hub and Spoke' PPP model to develop Radiology centres across the state. At present, 24 states of India are delivering radio diagnosis through PPP models. Moreover, the government of Uttar Pradesh has also initiated the setup of MRI and CT scanning machines based on the PPP model in eight medical colleges.

21. "India has crossed a Key Milestone in Universal Primary Healthcare", Press Information Bureau, 21 March 2021
 22. "CORRECTING and REPLACING the National Health Mission of Madhya Pradesh Selects Glocal Healthcare Systems to Bring Telehealth to 13.75 Million Citizens in the Republic of India", Business Wire, 27 January 2021

23. "Jharkhand TeleMedicine PPP Project", Apollo TeleHealth
 24. Covid 2.0 lifts lid off India's Health infrastructure system, Mint, April 2021
 25. "Hospital, director, medicine, CMO, college – CT scan and MRI machines are installed on the PPP model in medical colleges", 11 July 2021, UttarPradeshLive.com



Robust public health crisis management

1. National surveillance and pandemic management system

MoHFW at the onset of Covid-19 pandemic, developed Covid-19 India portal for reporting, motioning and analysis of the Covid-19 outbreak in India. Covid India portal captured data related to testing facilities, health facilities, logistics available, status of cases and other critical information that enabled policy makers and experts with data driven decision making. MoHFW leveraged existing platform like Integrated Disease Surveillance Programme (IDSP) and Integrated Health Information Platform (IHIP) for surveillance of epidemic prone diseases to monitor, detect and respond to any epidemic outbreak. Similarly, for management of the testing infrastructure, Indian Council of Medical Research (ICMR) developed online lab reporting system and RT-PCR application with QR code for tracking of reports across the country. Ministry of Electronics and Information Technology (MeitY) developed Arogya Setu application for surveillance system and providing real time information to citizens. Similarly, many state governments developed citizen application, facility and bed information system and

other platforms to strengthen the Covid-19 pandemic response.

Digital interventions played a critical role during the Covid-19 pandemic response management, and it also created a pool of non-integrated multiple platforms and duplication of digital interventions across Centre and states. This warrants to develop a single integrated National Surveillance and Pandemic Management System. Supporting the "Vision 2035-Public Health Surveillance in India" as proposed by NITI Aayog, Government of India should aggressively work towards convergence of disease surveillance and epidemic/ pandemic response management activities in a single integrated framework. A single integrated national surveillance and pandemic management system encompassing various modules can be developed. Some of the modules include citizen interface, surveillance and disease reporting system, rapid response team interface, connected network of laboratory facilities and health facilities, supplies management system, point of entry surveillance system, clinical management system, data analytics and other critical aspects of disease surveillance and pandemic management.

Covid-19 India Portal, MoHFW

Developed early last year, at the onset of the Covid-19 pandemic outbreak in India, MoHFW was quick to identify a need of online portal for Covid-19 pandemic monitoring and analysis. Covid-19 India enabled data collection from 730+ districts and thousands of field surveillance officers deployed on Covid-19 pandemic outbreak monitoring. The portal is integrated with ICMR testing and reporting system, CoWin application, and other such critical central and state government applications.





2. Public health observatories and health emergency observation centres

During the Covid-19 pandemic, rapidly developed control and command centres equipped the government with visibility of pandemic outbreak and data driven decision making. The WHO has also guided the member countries to establish Health Emergency Operation Centres (HEOCs) to achieve the mandates of IHR (2005) and to address emergencies that have health consequences to strengthen communications and coordination for effective public health response. MoHFW deeply valued the importance of a National Public Health Observatory (NPHO) that will equip MoHFW with centralized monitoring of public health system and future emergency medical responses. At present, MoHFW is the process of establishing a National Public Health

Observatory and HEOCs across India in a phased manner to build network of integrated control and command centres for coordinated and cohesive public health management.

Increasingly there is a need to create a 'Culture of Data' in public health, for intelligent use of data in planning and addressing complex health system challenges. Advanced analytics tools including GIS visualisations capabilities and data from various health programmes like IHIP, Covid Portal, e-Hospital, eSanjeevani Telemedicine, Health Information Management System and mobile apps could be fetched through API integration in a common framework and will be consolidated at a common observatory platform. The network of such NPHO and HEOCs will form backbone of robust monitoring system for the Indian public health.

Emergency Operations Center at Center of Disease Control (CDC), USA

The 24,000-square-foot facility, with seating capacity of 230 people, has been established to strengthen detection and response to public health threats and public health emergencies such as hurricanes, earthquakes, and oil spills. The observatory brings together highly trained experts and high-end technology to coordinate resources, information, and emergency risk communication.



3. Population health management and registry

During Covid-19, limited structured public health databases were available to identify high-risk patients for both Covid-19 and non-Covid-19 healthcare needs. India over a time has developed patient registry for cancer, rear diseases, diabetes, stroke and other diseases. However, integrated population health information leveraging registry for different diseases is currently not very structured and robust in India. Population health information system (PHIS) can

leverage data from HUIDs and other sources including clinical sources, claims reports, etc. PHIS could be developed with real-time dashboards to merge geography, demographics, and clinical characteristics of patients vulnerable to health crisis to better understand disease incidence, drive service delivery decisions, and identify "hot spots" among vulnerable communities. This dynamic ecosystem would heavily rely on de-identified individual-level patient information that originates from healthcare facilities, laboratories, and other sources.

PHM in Estonia and Israeli

Every person who has visited a physician in Estonia has an e-health card and has digitized a whopping 99 per cent of health data. Data is secured through blockchain technology and Estonia is now sharing its success story and learnings to inspire policymakers adopt digitisation

Clalit, a payer provider system providing care for over 50 per cent of Israel is yet another example for care integration and PHM adoption. The organisation has been using e-health records and central data warehouses for over two decades and has access to ~4.4 million patients' data which can be edited in real time and accessible for health staff. The use of advanced analytics on patient data provides insights to staff, which is leveraged to enhance disease prevention, provide better patient experience and support in policy changes related decision making.



Future healthcare workforce

1. National Healthcare Professionals Skilling platform

India needs a National Healthcare Professionals Registry and Skilling Platform with dual objectives to serve - Firstly, host Healthcare Professionals Registry (HPR) developed under ABDM with complete credentials of each healthcare professional including academic and professional credentials and continuous learning credits.

Secondly, it shall function as a learning management and skilling platform with host of free and paid skilling resources and content. At present, India doesn't have mandatory continuous learning credits system for annual/ periodic renewal of registration of healthcare

professionals unlike many other countries. A policy and system towards continuous learning and skilling of healthcare professionals is required in India with mandatory and voluntarily learning credit system. The National Healthcare Professionals Skilling platform shall aggregate public and private sector (like hospitals, pharmaceutical companies, medical devices, etc.) and academic institutes to provide healthcare skilling courses, contents, and certifications along with MoHFW, National Health Authority (NHA), National Skill Development Corporation (NSDC) and private sector. Such skilling platform will act as skilling resources marketplace, a platform that aggregates skilling partners and providers and bridges the demand and supply gap.

The National Board of Surgical Technology and Surgical Assisting, (NBSTSA), USA

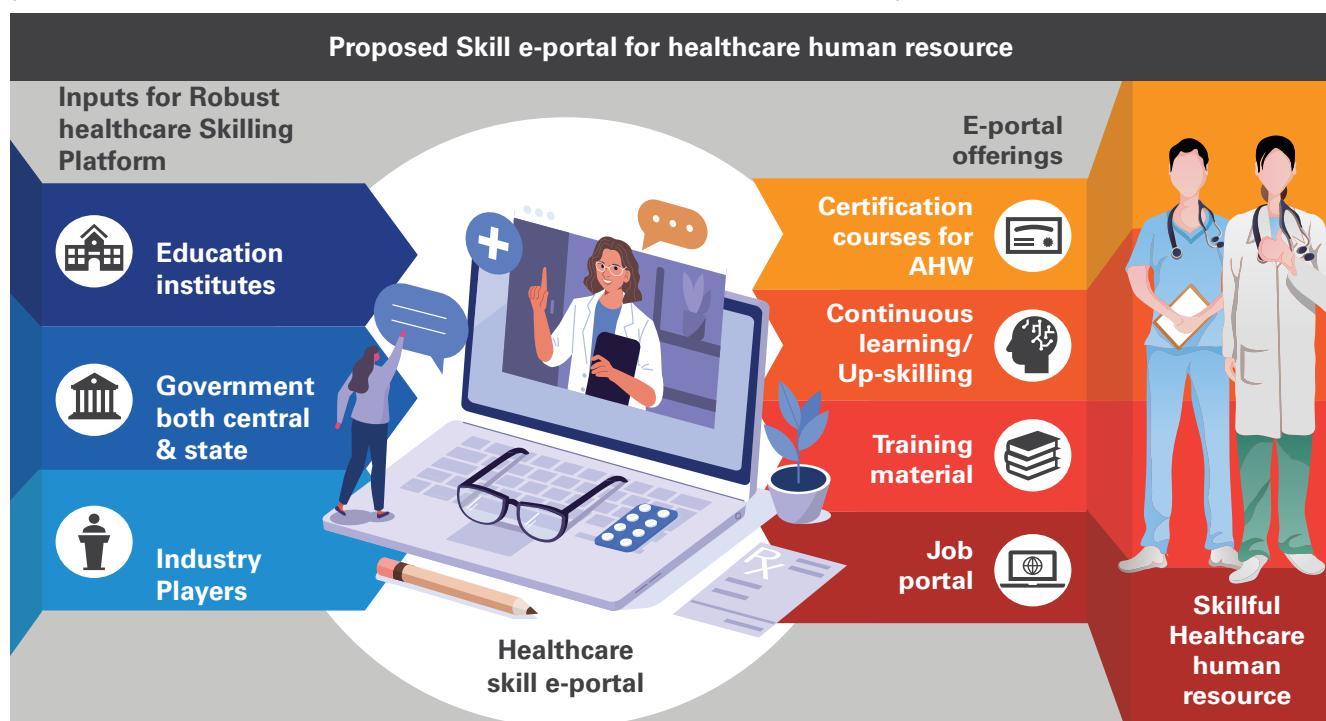
To ensure commitment to professional development, the NBSTSA has incorporated continuing education and ongoing credentialing as a mandatory requirement for renewing of licenses.

The NBSTSA renews certification every four years. Individuals renewing certification are required to submit a renewal application up to 6 months before their expiration date. Two options are available to individuals to renew certification:

- Earn and submit required continuing education credits within the renewal cycle to Association of Surgical Technologies (AST) and submit a renewal application to the NBSTSA
- Retake and pass the national certifying examination through the NBSTSA



Exhibit 11: Proposed e-skill portal for healthcare human resource





2. National Digital Health Literacy Program to prepare for digital health ecosystem

India's digital divide continues to widen, with only 38 per cent of households in India being digitally literate. In urban areas, digital literacy is relatively higher at 61 per cent relative to just 25 per cent in rural areas.

Healthcare sector has lagged in digital technology adoption with majority of public health facilities (SC/ PHC/ CHCs/ DH, etc.) and private health facilities (GP clinics, nursing homes, labs, etc.) continue to operate without ICT systems. Digital literacy in Indian healthcare workforce particularly in rural areas will be key to the success of the ABDM.

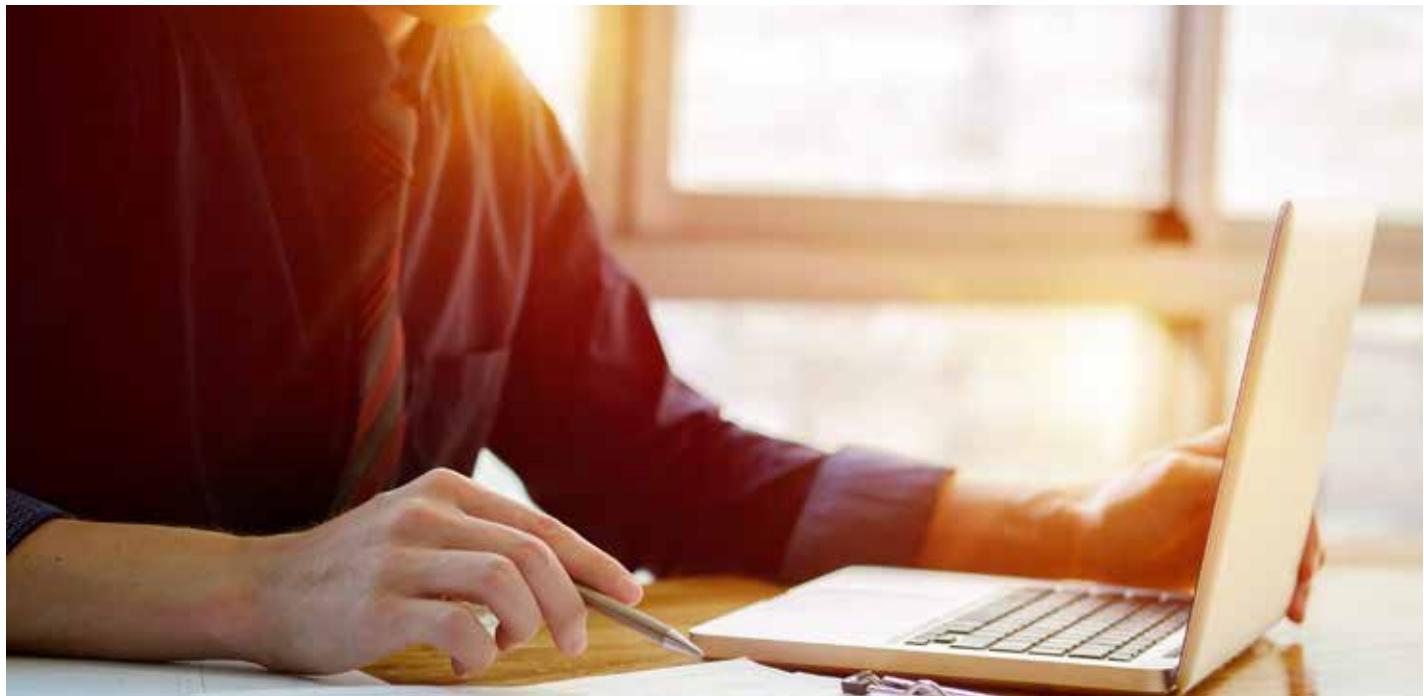
It is increasingly important to map digital literacy of Indian healthcare workforce across states, with a mechanism to train and monitor digital literacy competency of every healthcare worker. A holistic efforts and mission mode program to drive digital health literacy must be formulated by MoHFW, MeitY, NHA, ABDM, State Governments, NSDC, Healthcare Sector Skill Council and industry bodies. ABDM Training Centre at each district level must be set-up to drive digital health literacy in healthcare sector.

Kerala digital literacy efforts

Kerala is one of the states with more than 70 per cent digital literacy at the household level and this is primarily attributed to the various head-on initiatives by the state government over the years. In 2002, Kerala government launched the ambitious Akshaya project with the objective to make at least one person in each household computer-literate in the Malappuram district of Kerala. The success of the project made Malappuram the first e-literate district in India and Akshaya a state-wide endeavor. Numerous other initiatives were also undertaken by the Kerala government, such as the IT@School initiative (now known as KITE (Kerala Infrastructure and Technology for Education), which was launched in 2001 to make school students digitally literate, Information Kerala Mission, and Kerala State IT Mission.



26. The digital dream: Upskilling India for the future, Ideas for India, March 2021





3. Healthcare skilling centre across districts to build India as healthcare skill capital of the world

India faces dual challenges of shortage of healthcare workforce and need for upskilling of existing healthcare workforce. India needs to set-up healthcare skilling centres across districts to drive up-skilling of existing healthcare workforces and training of community healthcare volunteers.

Such centres can be connected with virtual institutes to impart skilling courses on hybrid format. Covid-19 pandemic response management was strengthened with community participation and emerging as Covid

warriors. The pandemic highlighted the need to create stream of community healthcare volunteers as part of contingency efforts to mitigate any community health crisis. Such centres would play an important role as a nodal centre for training of community volunteers, providing information, education, and communication to community in critical times of healthcare crises.

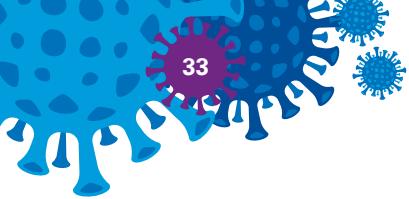
Financial assistance from private sector, NSDC and Healthcare Sector Skill Council can be leveraged for setting up of such centres. Private players can help the workforce to get trained on handling of infection control practices, disease management, clinical care protocols, medical equipment, quality management, digital literacy and other areas.

India International Skill Centre (IISC) Network

The NSDC launched IISC Network last year, as a nodal platform to facilitate international workforce mobility opportunities for Indians. IISCs undertake activities like incremental skill training on international standards or testing/assessment of skills for overseas employment.

In India, 95 organisations are part of the network operating through 537 IISCs across more than 240 districts as of January 2021. The government has taken several initiatives to provide employment opportunity to the youth abroad by signing MoU/MoC with various countries such as Germany, Japan, Switzerland, United Arab Emirates, Qatar, Belarus, United Kingdom and France.





Improving private sector participation and support

1. Revive strategic purchasing and PPPs

Making greater strides towards UHC requires addressing various inefficiencies and gaps in India's public health structures and reducing inequities in the quality of care. Currently, there is enormous scope for the country's healthcare sector for tapping into the still potent private sector and leveraging "strategic purchasing" as an integral approach to fast-track the achievement of larger health goals. India's public sector can enter into strategic purchasing contracts in the following key areas:

- **Strategic purchasing of clinical program management services:**

management services: For the purpose of upgradation of facilities at existing district hospitals wherever secondary care and/ or tertiary care services are not available, the government can take up the responsibility of building, equipping and operating the facility and evaluate strategic purchasing of clinical programme management services from single or multiple partners like

individual specialist/ super-specialist or private providers on fees for service engagement model. Such models can enable the government to invest and own such a facility and the private sector could cater to AB-PMJAY patients without investing in building such a facility.

- **Developing public health infrastructure under strategic purchasing models:** Private financing investment-based model with medical equipment players and private providers with strategic purchasing of services by the government for AB-PMJAY patients could be developed to lease or pay per use for capital intensive medical equipment such as Cath lab, CT scan MRI and other equipment. The model could also permit a private player to expand services and also cater to paid patients to further augment the viability.

Moving forward, a strategic purchasing of services will not only help utilize resources economically but also bring significant reduction in health expenditure.²⁷

2. Healthcare Infrastructure Development Fund

The government has set-up dedicated fund/ schemes for supporting infrastructure development across various sectors like Micro, Small and Medium Enterprises (MSME), start-ups, electronic development, medical devices park and others. Similarly, government funds public health infrastructure through NHM, Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) and other programs. However, there are limited low-cost capital options for private sector to leverage for

development of healthcare infrastructure. There are gross geographical inequalities as most tertiary care beds are confined within tier-I/II, making healthcare inaccessible to large majority of population.

There is dire need to set up a healthcare fund to reduce cost of capital and viability gap funding. Capital at low cost, viability gap funding for capital expenses, subsidies on medical equipment and financial benefits linked to development of projects across Tier-II and Tier-III cities. Moving forward, the government can delve into strategic use of healthcare fund for the setting-up of sustainable healthcare facilities.



27. "Niti Ayog proposes 'strategic purchasing' of services, to reduce health expenditure", 21 November 2019, medicircle

28. "Strategic Purchasing for Universal Health Coverage- A study on Health Insurance in Madhya Pradesh", December 2016, ResearchGate



3. Driving transparency in healthcare

Transparency in healthcare is a contested concept, with a wide range of interpretations based on country, care setting, and stakeholder group. This diversity of terminology is symptomatic of a lack of strategic clarity about what constitutes an effective, transparent health system. KPMG International's Global Report, "Through the Looking Glass" in 2017 highlighted six main dimensions of health system transparency.

These dimensions cover the main issues of concern according to health system, organisations and stakeholder groups globally and form the basis of our definition of transparency, as well as foundation for the global health system transparency scorecard:

1. Quality of healthcare: transparency of provider level performance measures, especially the quality of outcomes and processes.

2. Patient experience: patient perceptions of their healthcare experience and outcomes.

3. Finance: price and payments transparency, and the public nature of accounts for healthcare organisations.

4. Governance: open decision making, rights and responsibilities, resource allocation, assurance processes and accountability mechanisms.

5. Personal healthcare data: access, ownership, and safeguarding of patients' individual health data.

6. Communication of healthcare data: the extent to which all the above is presented in an accessible, reliable and useful way to all relevant stakeholders.

India needs to move beyond Health Index and District Hospital Index and establish national benchmarking framework for periodic reporting of health indicators cutting across clinical care, disease management, operations, turn-around time, financial, governance, patient experience and other such indicators that entail transparent health system across public and private sector.

Ministry of Health, Singapore²⁹

Collects and publishes benchmarks and statistics of private and public health providers on admission rates, waiting times, bed occupancy rates, diseases and more. It also provides fee benchmarks for private sector professional fees and bill amount information for public and private hospitals.



4. Simplify regulatory compliances, maximize governance system

Health sector regulatory compliances vary from states to state in India, with several new laws further added by central government and state governments in the last 5 years to strengthen governance of the health system. In some instances, the scope of a few regulations is still unclear and it often has hindered both traditional and digital health providers. There is emerging need to simplify regulatory framework with

single window approval system, minimize compliance requirements and maximize self-governance by adoption of standard practices and benchmarking. Institutionalizing an apex body which can ensure uniform regulatory framework for healthcare across the country. Catering to emerging healthcare landscape in India like digital health, artificial intelligence, machine learning, software as a medical device and other such areas is key to simplifying the governance systems.



29. "Strategic Purchasing for Universal Health Coverage- A study on Health Insurance in Madhya Pradesh", December 2016, ResearchGate



Embedding digital health to bridge systemic gaps

1. Health UID, beyond UID Number

The unique health ID creation under NDHM is currently in its nascent stage and covering 1.3 billion population will require time and consistent efforts. Public health research and care provision in the country can be significantly revolutionised with proper use of health IDs. However, there are hurdles in the way of successful health UID adoption and implementation like how UID will be integrated with multiple IT systems currently used in public health and private health sector. The current UID linked with PHR will act as a mere database with limited meaningful health records and will lack the features that will encourage citizens and providers to avail of Health UID.

Health UID issued as virtual health cards could act like an ATM card preloaded with healthcare benefits like entitlement of health schemes, health coverage for any medical emergency, primary care benefits, certain free 'Jan-Aushadhi' pharmacy coupons, health check-ups and other such benefits that can be availed across any public or private health facilities. The current UID linked with PHR will act as a mere database with limited meaningful health records and will lack the features that will encourage citizens and providers to avail of Health UID.

2. Incentivise providers for digitisation

India has embarked on digital health journey with the launch of ABDM, however there is very limited clarity on how thousands of providers including hospitals, labs, GP clinics, etc. across private health and public health will be supported in undertaking digitisation and integrations. The success of ABDM will depend on the ability to onboard vast number of public and private health providers to adopt digital health solutions and standards to build digital health ecosystem.

MoHFW, MeitY and various other government bodies offer health IT solutions like e-aspatal, HMIS, telemedicine, etc. but very limited number of providers have leveraged these solutions due lack of incentives for embarking on digital transformation. Unless a well-thought through roadmap is articulated for ABDM to provide technical and financial incentivisation to vast number of small and larger providers, the mission is very unlikely to achieve great success. The capital and operational expenses could be factored as a subsidy and/ or indirect tax incentives.

3. Promoting open-source digital health solutions

The government of India has been promoting the use of open-source technologies in the e-Governance field within the country in order to leverage economic and strategic benefits. Further, the National Policy on Information Technology, 2012 has cited, as one of its objectives, to "Adopt open standards and promote open source and open technologies". MoHFW launched "OPD e-Sanjeevani" platform for patient to doctor teleconsultations to bridge the accessibility of medical care during Covid-19 pandemic. Many such digital health platforms by private sector, NGOs and governments played crucial role in providing accessibility to care during pandemic. It is therefore utmost important to continue to adopt open-source digital solutions e.g., OPD e-Sanjeevani that could be leveraged by GPs, nursing homes and other such providers on open-source development systems and provide customised teleconsultation/ virtual care under co-branding. Similarly, other solutions like e-ICU, remote health management system, e-PHC, etc. could be developed on open-source platforms. To drive ABDM, open-source digital solutions will be key to ensure that financial and proprietary solutions do not become barriers to right of health in the digital health ecosystem.



Inspired Electronic Health Record (EHRs)³⁰

While most EHR systems remain proprietary, over 30 countries now use open-source EHRs in some capacity. Founded in a rich legacy of global initiative to meet shared, human needs, successful open-source healthcare IT initiatives are not only taking a hold in the United States, but also spreading to Mexico, Thailand, France, Uganda, Zambia, Kenya, Canada, Germany, the UK, Australia, Haiti, and many others. With a team of physicians, nurses, health IT, and human computer interaction experts, Golivo designed and co-authored an open-source e-book to distribute ideas, designs, and techniques to health IT and EHR vendors to jumpstart EHR design on a national level. The result of the project was a lightweight, accessible, open-source design policy.



4. Uberisation of referral transport system

In the last decade, India has significantly made progress towards strengthening referral transport system leveraging PPPs and technology to ensure availability of referral transport across last miles. However, the service level maturity of referral transport system varies across states in the country. Amidst Covid-19 pandemic, citizens across the country at times struggled to navigate through call-centres for ambulance booking and owing to lack of well-equipped ambulances.

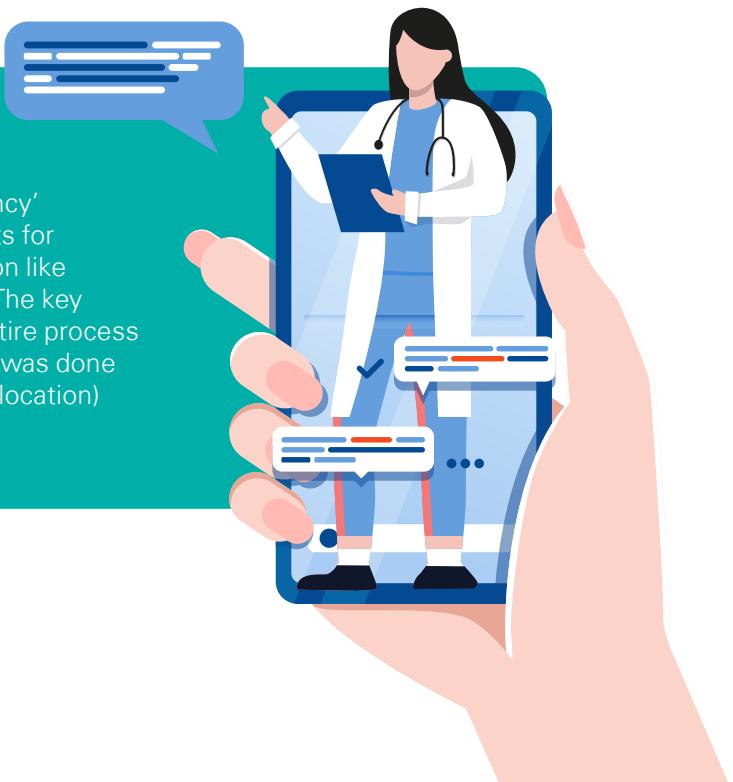
Taking the learnings from the Covid-19 pandemic in India, there is a need to further integrate public and

private referral transport system with single citizen interface with mobile based aggregation of referral transports without geographical boundaries like mobile-app based cab services.

A citizen facing single mobile-app, aggregating ambulances, Geographical Information Systems (GIS) and General Packet Radio Service (GPRS) enabled vehicle location tracking system, IT enabled call-centre, robust feedback mechanism, manuals for quality audit of ambulances, and multilingual virtual agents. The payment of such public and private referral transport could be interfaced with applicable government health programme, self-paid services and multi-mode payment system.

Gujarat 108-Emergency mobile app

Gujarat launched mobile application for '108-Emergency' ambulance services in 2017 to enable service requests for ambulances across the State with an exact information like distance, time and route of arrival of the ambulance. The key objective was to reduce the human intervention in entire process of emergency service in case of calling ambulance, it was done by leveraging best in class technology of GPS based (location) services and automating entire processes.



30. It's Time for Open-Source Healthcare, Design Museum Magazine, Healthcare Issue 012

5. National Swasth Citizen app

Covid-19 pandemic also led to multiple sources of information, lack of correct and timely information and challenges in navigating to avail required healthcare needs like beds, oxygen, referral transport, labs, medical supplies, etc. Based on learnings from the Covid-19 pandemic, it is advisable to have one national health mobile app, i.e. National Swasth Citizen App. to meet all the healthcare needs of a citizen. A single window of information, education, communication to citizens from the health authorities and tool to navigate for healthcare needs required by every citizen. Using National Swasth Mobile app, a citizen shall get authentic source information. The Swasth App

could be linked to Health UID and enable citizens to understand the healthcare entitlements and applicable schemes. Such app could be used for requesting ambulances, nearest hospitals and doctors, bed availability status, appointment booking, laboratories, blood bank, oxygen, pharmacies, telemedicine/online consultation, vaccination, reporting and other such healthcare needs of citizens. With the digital enablement of health sector during Covid, it is high time that India should move towards, One Nation One Health App approach which will not only facilitate citizens with ease of service but also support the digital health vision of country with health UID enabled service delivery.

UMANG app, Government of India

UMANG (Unified Mobile Application for New-age Governance) is developed by MeitY and National e-Governance Division (NeGD) to drive Mobile Governance in India. UMANG provides a single platform for all Indian citizens to access pan India e-Gov services ranging from central to local government bodies. Since its launch, UMANG has come a long way. The mobile application's services count has now reached 2,039 (373 from Centre, 487 from 27 States and 1,179 utility bill payment services). UMANG app has reached a level of more than 3.2 crore downloads and ~2.35 crore registered users.

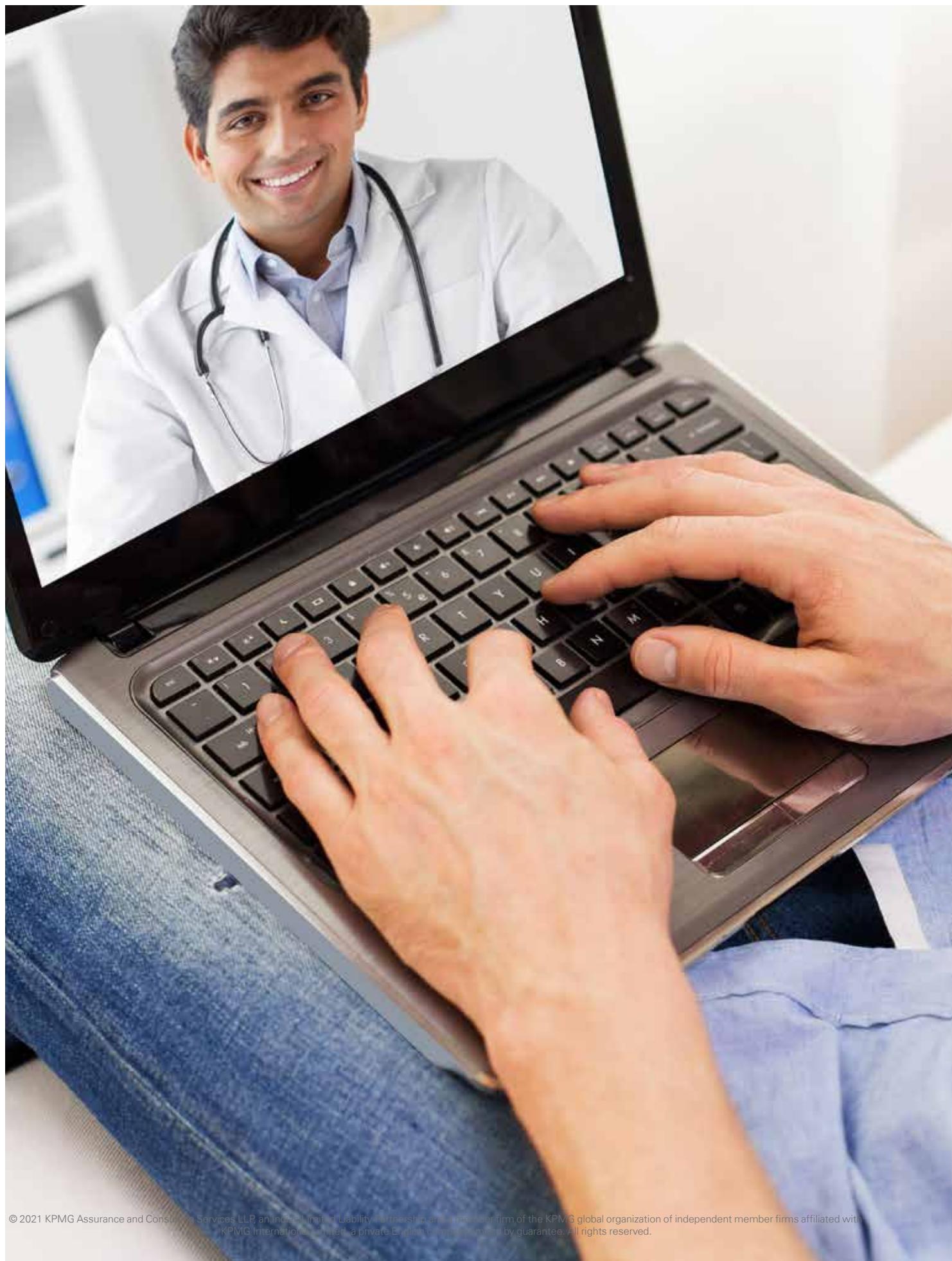


5. National strategy to promote telemedicine and virtual care

As per a report published by Telemedicine Society of India, number of people using online health consultations increased three times between March 2020 and November 2020. Physical health appointments went down by 32 per cent. Non-metros witnessed a 7x growth in online consultations compared to 2019. Online consultations from people above age of 50, contributed to 12 per cent of total consultations, as compared to 5 per cent in 2019.

The National Telemedicine Service of the MoHFW has completed 90 lakh teleconsultations in the country.

eSanjeevani platform has been consistently getting diffused in the ecosystem and currently it is serving 70,000 patients on daily basis. At present eSanjeevani OPD is hosting over 430 online OPDs, around 400 of these are specialty and super-specialty online OPDs. The government must further outline national strategy for promotion and augmentation of adoption of telemedicine and virtual care as an important element in bridging healthcare gaps in India. Open-source platform for OPD e-Sanjeevani, private sector participation and focused implementation will play a big role in continuing the telemedicine and virtual care adoption phenomena in India.



Way Forward



The pandemic has reasserted the fact that the healthcare landscape is the backbone of a country and has opened a floodgate of opportunities for the country to head towards a digitally resilient healthcare system which is capable of not only fighting the current situation but also be proficient in armoring against the upcoming unforeseen challenges. Hence, it is the correct time to assess the previous faults and prepare for the future in addition to establishing trust and synergies of mutual cooperation between the government and private players.



1

Keep up the momentum

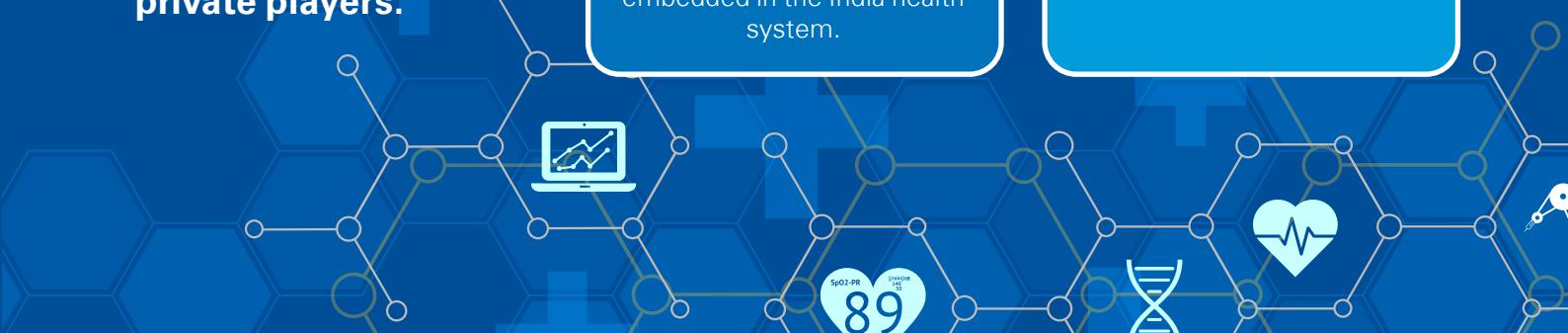
The pandemic proved to be an “eye-opener” for the government and the policy makers and made them cognizant of the upsurging potential of technology in mitigating the healthcare risks to a greater extent. The last two years of Covid-19 pandemic in India showcased unprecedented speed of system strengthening, rapid policy making and response planning, cohesive efforts by all stakeholders, and innovation from all walks of life.

The focus on health system strengthening must continue on war-footing to further cement the efforts of the last 24 months in bridging systemic issues in the health system. Emergency Covid Response packages (ECRPs) and other such efforts must be embedded in the India health system.

2

Institutionalize the learnings and recommendations

Every crisis provides significant learnings and an opportunity, if we do not again forget and get into old monotonous routine and fail to carry these life-changing learnings to our future; if we fail to institutionalize the learnings of last 24 months into building a resilient health system, then it will be great opportunity lost by this generation. A systematic approach is required led by the government to ensure the learnings are institutionalized by healthcare providers, municipal corporations, district administrations, state governments and central government.





3

Private sector as a partner

All the stakeholders (government, private entities, etc.) should work together to outline a charter of role and contribution, to establish trust and to facilitate uptake of policies and digital transitions. The country has witnessed the expansion of the concept of collaboration between public and private entities to build healthcare infrastructure and combat the systemic gaps of the healthcare ecosystem. Along with the expansion of already established operating models such as PPP, the pandemic also witnessed the emergence of new models that have broken the long-standing barriers of trust and lack of mutual appreciation of contribution by both the parties. The government should engage in implementing conducive mechanisms and strategies to expand PPPs and adopting more such hybrid operating models.



4

Digital as a core component of the health system

The introduction of telemedicine guidelines and the launch of the ABDM are small leaps towards the grander scheme of digitizing the country's healthcare records. A backbone can be offered to the digital health ecosystem only if the country's policy makers and other stakeholders mutually indulge in the mission to address the challenges that are faced during its expansion such as data privacy, internet connectivity, etc. by making innovations and improvements through the proliferation of high-speed network connecting across the country, creating tech-enabled systems, and a dynamic legal/regulatory framework and well-drafted incentive structures to achieve the objective of "digitally resilient healthcare system".



5

Preparing for future health system needs, towards building "Healthy India"

India is expected to overtake China as the most populous country with share of senior citizens forecasted to double from 8.6 per cent in 2011 to 16 per cent by 2041 and by 2050, India is expected to have 300 million senior citizens. The burden of disease, especially from NCDs will further put strain on the healthcare system, considering nearly 5.8 million people already die from NCDs every year. India currently has around 60 million diabetics, a number that is expected to swell to 90 million by 2025. The rising NCD burden is estimated to cost India US\$4.58 trillion before 2030. Unless acted upon immediately, India will run out of time to harness the potential of its youth to drive economic growth and as well as adequately plan for a large geriatric population to be housed by 2050.



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