Content available at: https://www.ipinnovative.com/open-access-journals

The Journal of Community Health Management

Journal homepage: https://www.jchm.in/

Review Article

Digital governance in transforming health systems and health policy in India

Manoj Kar[1]*, **Sipra Ram**[1]

[1]*School of Governance and Public Affairs, XIM University, Bhubaneswar, Odisha, India*

ARTICLE INFO

Article history:
Received 12-01-2024
Accepted 13-02-2024
Available online 17-04-2024

Keywords:
Digital Governance
Transforming Health Systems
National Health Policy
Universal Health Coverage
and UNSDGs (Sustainable
Development Goals)

ABSTRACT

The cornerstone of a thriving nation is the health of its citizens, and Universal Health Coverage (UHC) stands as a vital measure of success of its health systems in promoting inclusivity and well-being. The 21st century has seen a growing focus on reshaping health systems around individuals, with integration of data and digital technologies offering significant opportunities for advancing concept of 'digital governance in transforming health systems'. However, despite the challenges faced by health policymakers, a tangible transformation in 'digital health governance' is still underway.

This policy review explores India's digital governance initiatives aimed at revolutionizing healthcare accessibility and delivery to contribute to the realization of UHC. It sheds light on national digital health programs like National Digital Health Blueprint (NDHB), National Digital Health Mission (NDHM), Ayushman Bharat Digital Health Mission, and global health interventions. Addressing challenges such as limited infrastructure and hesitancy toward digital adoption, the paper emphasizes solutions like capacity building and awareness generation as discussed within the national health systems framework. It underscores the importance of optimal governance models fostering interdisciplinary collaboration among key stakeholders, including government, startups, hospitals, and academic institutions. The ultimate goal is to offer insights into strategic digital transformations, supported by robust public policies and governance mechanisms, which can shape a more equitable, efficient, and digitally empowered healthcare ecosystem. This, in turn, contributes to the progress of UHC in India by 2030 (UN-SDGs).

1. Introduction

The evolution of digital technologies and advancements in governance practices brings forth unprecedented opportunities to revolutionize healthcare access, quality, affordability, and delivery at a global level, aligning with international health objectives and strategies in global health. The intersection of healthcare and technology has inaugurated an era marked by data-driven, scalable, and innovative interventions capable of extending healthcare solutions globally.

Despite the array of digital health solutions, including electronic medical records, health insurance payments, and health management information systems (HMIS), a common shortcoming is the lack of a comprehensive approach to digital health and its application to global health challenges. The deficiency in holistic governance practices, driven by structures, principles, policies, and processes, distorts roles and responsibilities, leading to resource fragmentation, duplicated efforts, inefficiency, and ineffectiveness in health system outcomes. The realization of UHC within a digital health framework hinges on the integration of good governance, accompanied by a well-defined digital strategy and implementation support aligned with the country's overarching vision of 'Digital Health

* *Corresponding author*.
E-mail address: manojkar.iie10@gmail.com (M. Kar).

https://doi.org/10.18231/j.jchm.2024.003

Governance' for progressing 'health for all' [1]

2. Good Governance is key to Digital Health Solutions Globally

Without effective governance, digital health systems may fail to adequately address the needs and priorities of the health system, lacking transparency and accountability. Good governance plays a crucial role in building functional health system's capacity at all levels—local, district, and national—across the HMIS. This, in turn, facilitates the achievement of equitable access and the delivery of quality, affordable health services, shifting the focus from 'Care-focused' to 'Health-focused,' a pivotal step in advancing UHC within a country (Figure 1). [2]

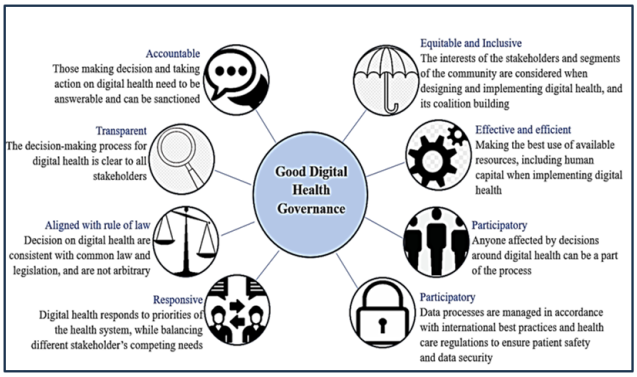
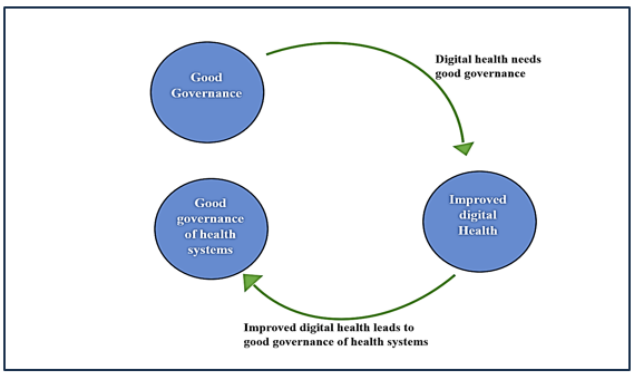


Figure 1: Source: ADB sustainable Development working paper series
Principles of digital health governance

Good digital health governance is based on the principles of accountability, transparency, rule of law, responsiveness, equity and inclusiveness, effectiveness, efficiency and participation as well as confidentiality. [3]



Source: ADB Sustainable Development working paper series

Figure 2: Cycle of good governance, digital health and health systems

Effectiveness in 'digital health governance' is imperative, playing a dual role in both requiring the essence of 'good governance' and contributing to the governance of 'health systems' (Figure 2). The production of accessible, high-quality health data through digital health platforms not only elevates the transparency and accountability of health systems but also enhances the overall efficiency of these functional systems. The overarching goals and objectives of a well-functioning health system are centered on delivering healthcare that is of high quality, affordable, accessible, equitable, and efficient (Figure 3).

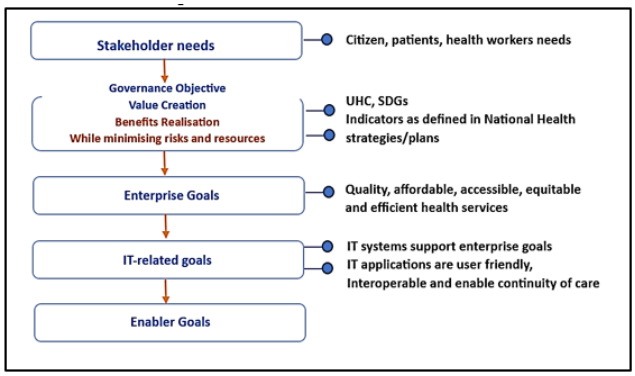
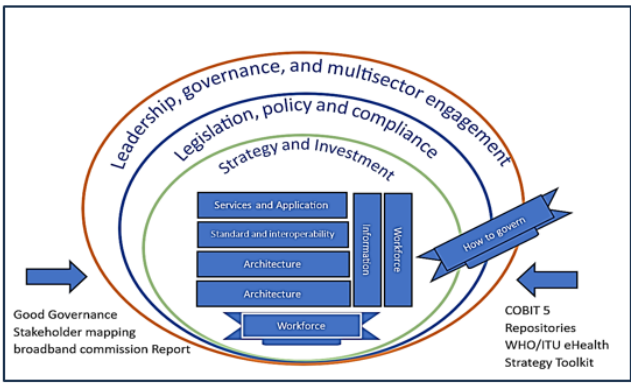


Figure 3: The Cascade of health sector goals

3. How and What of Digital Health Systems Governance

The 'digital health system governance' cycle, is structured into three different tiers, offering guidance on the process of governance (WHO e-Health Strategy Toolkit). The first tier focuses on leadership, governance, and multisectoral engagement. Within this layer, the emphasis is on steering and coordinating the functions of the digital health systems framework. It involves establishing leadership structures, governance mechanisms, and engaging multiple sectors to ensure effective direction and coordination in the governance of digital health initiatives (Figure 4).

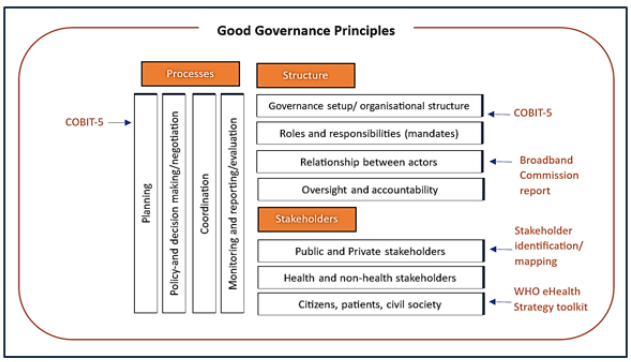


Source: World Health Organization

Figure 4: Digital health systems framework

In the second tier of the 'digital health system governance' cycle, the focus shifts to the governance process, encompassing legislation, policy, and their compliance. This tier is crucial for creating an enabling environment that ensures alignment of digital technology policies across sectors and nations, thereby facilitating the enforcement of rules and regulation. The aim is to establish trust and safeguard the interests of both the public sector and the workforce within functional health systems.

The third tier involves strategy and investment, ensuring that financing priorities are well harmonized across governments, donor agencies, and the private sector. Adhering to the mandates of national digital health strategies, this tier emphasizes the establishment of a supportive and functional governance structure to effectively implement and manage overall strategic aspects of digital health initiatives.



Source: Good Governance Principle, WHO

Figure 5: Good Governance Principles, WHO.

The functioning of digital health systems revolves around six key components (Figure 5). These components, which include the utilization of 'Human Resources for Health' and the management of generated, stored, and retrieved data, must be integral elements of the governance structure for 'digital health systems'. To comprehend and delineate these components, essential resources can be consolidated within a single framework, categorizing governance into three main domains of 'functional health systems': process, structures, and stakeholders (WHO).

The delivery of healthcare is inherently intricate in most societies, involving numerous stakeholders. Advocacy for digital health governance underscores the importance of promoting country and global governance with active citizen and community participation to ensure accountability (WHO). This objective can be achieved through regular monitoring and inclusive, transparent reviews of progress and performance at various levels, including facility, at the subnational, national, regional, and global. Such monitoring should be closely linked to the targets set by the 'Health Sustainable Development Goals' on progressing objectives of UHC.[4] A robust digital health governance framework must demonstrate adaptability, capable of responding to evolving needs and objectives as digital health continues to evolve within the development and functioning of the overall 'health system'.

4. Digital Health Systems Governance Framework (WHO)

1. Clearly define the digital health enterprise and identify important stakeholders from various agencies.
2. Reach consensus on what aspects of digital health require governance, including architecture, assets, standards, and applications.
3. Agree on 'health system governance' instruments such as a digital health strategy, legal framework updates, and required investments.
4. Specify leadership roles and assemble key resources from concerned ministries, ICT, statistics, health insurance, and the private sector into a national digital steering platform.
5. Adopt a digital 'health system governance' framework, outlining governance levels at central and subnational tiers based on decentralization and the mix of public–private healthcare providers.
6. Establish performance measures and monitoring processes to ensure accountability and enhance the health system towards patient-centric and integrated care.
7. Regularly revise and keep the governance framework active to align with changing needs of the advancing technological landscape.
8. Integrate the mandate of public health and digital health system's governance to ensure equitable and affordable access to quality healthcare services, to enhance and safeguard population health.

5. Digital Initiatives in India within the Broader Global Health Framework

Within the context of Global Health determinants elaborated above, the role of Digital initiatives in enhancing healthcare delivery, data management, and overall health outcomes worldwide can be regarded as significant. All government or private interventions on improving health outcomes stand on the foundation of evidence based research for which the availability of data becomes crucial. In terms of data collection and surveillance, Digital tools aid in collecting, analyzing, and sharing health data, facilitating early disease detection, monitoring outbreaks, and tracking health trends. The use of this data is key to enable digital healthcare platforms like telemedicine to improve the reach of timely healthcare services to underserved populations and resource-limited areas. Digital technologies support global health research by enabling data sharing, collaboration, and advanced analytics. Digitization can help in fighting

future emergencies and challenges to global health by enabling the collection and analysis of large amounts of data. This data can be used to identify patterns and trends, predict outbreaks, and develop targeted interventions. For example, (Artificial Intelligence) AI-powered systems can help predict which areas are at risk of disease outbreaks and help allocate resources accordingly. Digital health technologies can also help improve access to healthcare in remote or underserved areas.

Digital platforms enable remote individual healthcare consultations, but also in the wider dissemination of health information, preventive measures, and treatment guidelines to a broad audience. During pandemics, as evidenced during the Covid-19 pandemic emergency, digital tools demonstrated their use in coordinating responses, tracking the spread of diseases, and providing accurate information to the public. Online platforms offer training opportunities for healthcare professionals, enhancing their skills and knowledge while 'mobile apps' can provide health tips, medication reminders, and even diagnostic tools in areas with limited access to healthcare facilities.

Good health of the individual as well as of all citizens in a country is essentially critical for a sound and robust system of social security and foundations of 'human development'. India made considerable progress in health indicators and life expectancies since its independence, but still a long way to go in comparison with developed and even many developing countries in terms of health, quality of life and well-being. Significant gains made since inception of NRHM in 2005 on account of achievements of National Rural health Mission (NRHM) worth mentioning. Since it's launching of 'Digital India' campaign in 2015, India becoming the second-fastest digital adopter of the world.[5] India has gained global recognition as a formidable player in the realm of digital governance, owing to the remarkable accomplishments of the Indian Space Research Organization (ISRO) in the field of space technology.[6]

India has positioned itself as a digital powerhouse by expanding its digital health infrastructure, taking a leading role in strategic discussions on utilizing Artificial Intelligence (AI) to enhance the public health system.[7] The Arogya Setu App, initially introduced as a contact-tracing application for Covid-19, has garnered more than one billion downloads and has effectively tracked over two billion vaccinations. The launch of the Ayushman Bharat Digital Health Mission by India's National Health Authority establishes a foundation for shaping the future of public health (NDHB, 2020). Concurrently, India's healthcare and health systems face persistent challenges, particularly evident in the period of global health crisis. The country falls short by half of the World Health Organization's recommendations for the number of doctors, nurses, medical technicians, and health facilities needed to serve its population. Major public health issues include inadequate budgeting, a burden of infectious diseases, the escalating epidemic of Non-Communicable diseases, including lifestyle disorders, and a growing mental health burden even in the new normal following the global Covid-19 pandemic.[8] India's Healthcare Access Quality Index (HAQ), is ranked 145 out of 195 countries globally.[9] There is potential for a significant positive turnaround if health systems are prioritized, addressing existing challenges through adequate financing, staffing. Digital governance offers a rational approach to improving the efficacy and efficiency of functional health systems, influencing health outcomes and the impact of health services.

The realization of India's growth potential is contingent upon the digitization of health infrastructure and healthcare delivery (MOHFW). The country's digital governance blueprint encompasses an architectural framework aimed at integrating health data across both public and private sectors, as initiated through the National Digital Health Blueprint (NDHB) in 2020. To achieve actionable impact, the current Digital Health Mission addresses its vision to encompass a forward-looking digital health ecosystem, incorporating telemedicine, digital therapeutics, and digital diagnostics. The adoption of digital solutions within health systems, spanning care, prevention, diagnostics, and treatment, is seen as a rational approach to progressively attain the strategic goals outlined for "Health for All" for progressing objectives under UHC by 2030, as per the United Nations Sustainable Development Goals (UN-SDG).

These can be rationalized in addressing Digital Governance Connecting National Health Systems (MOHFW);

1. Blending digital approaches can address health systems problems for improvement in accessibility, affordability and quality of care
2. Emerging digital governance well fit into India's strategic national missions on Ayushman Bharat, Swatch Bharat, Digital India and Make in India
3. Opportunities emerging for influencing policymaking in global health along with development of digital governance. Health technology led digital governance need top most attention of policy makers for using global health framework.

India's National Health Policy of 2017 emphasizes the establishment of an integrated health information system to enhance efficiency, transparency, and citizen experience in healthcare using health systems approach.[10] The creation of an integrated national health database is envisioned as a valuable asset capable of supporting intricate data analytics, which can play a pivotal role in designing and implementing policies. This database will facilitate automated and timely interventions within the health system, such as disseminating targeted health messages, managing stock-level notifications, and offering training content for medical

research and education. These initiatives aim to build a robust foundation for innovations in digital health. Once operational, the integrated database is anticipated to connect and streamline India's currently fragmented health system, marking a crucial step in enhancing its efficiency and preparing it for the future of digital health governance.

6. Notable Initiatives on Digital Health Globally-WHO;[11]

1. Global Digital Health Certification Network (GDHCN): This initiative aims to promote the development and adoption of digital health technologies by providing a platform for stakeholders to share best practices, develop standards, and build capacity
2. Global Emergency and Trauma Care Initiative (GETI): This initiative aims to improve emergency and trauma care in low- and middle-income countries by leveraging digital technologies to enhance the quality of care, reduce morbidity and mortality, and improve patient outcomes.
3. Global Genomic Surveillance: This initiative aims to use genomic sequencing to track the spread of infectious diseases, identify new variants, and develop targeted interventions.
4. Global Health and Peace Initiative (GHPI): This initiative aims to promote peace and stability by improving access to quality healthcare services in conflict-affected areas.
5. Global Influenza Surveillance and Response System (GISRS): This initiative aims to monitor the spread of influenza viruses globally, detect new strains, and develop vaccines.
6. Global Initiative for Emergency and Essential Surgical Care (GIEESC): This initiative aims to improve access to safe, timely, and affordable surgical care in low- and middle-income countries by leveraging digital technologies to enhance surgical training, quality improvement, and research.
7. Global Initiative for Childhood Cancer: This initiative aims to improve access to quality cancer care for children in low- and middle-income countries by leveraging digital technologies to enhance cancer diagnosis, treatment, and research.

7. Digital Transformation for Integration of Policy Action and Leadership

The primary obstacles to establishing 21st-century digital health systems are not rooted in technology but rather lie in institutional, organizational, and political factors, requiring a substantial political will (WHO). Advancement hinges on the creation of an enabling policy environment, necessitating decisive action by governments on following three key fronts:

1. *Digital strategy.* Countries must focus actively to monitor and leverage the opportunities presented by digitalization. This entails adopting a unified vision, comprehensive plan, and policy framework that aligns with a broader, multisectoral digital health strategy.

2. *Governance of health data.* This approach facilitates the productive utilization of data and digital technologies while ensuring security and respecting individual privacy. However, significant hindrances include a lack of trust among patients, public concerns about respective confidentiality, legal barriers, and challenges faced by data custodians and other stakeholders in agreeing on data standards and formats for exchange, both within and across countries.

3. *Institutional and Operational capacity.* Ensuring the workforce is equipped and prepared to seize the opportunities presented by digital technology is essential for effectiveness in human resources for health. Empowering the public, particularly those with complex situations, to benefit from these advancements is crucial. The positioning of systems and institutional arrangements that facilitate efficient linkage and analysis of data holds significance for functional health systems. Establishing an enabling environment becomes essential, for key stakeholders and actors to access data promptly, extract knowledge, and drive change to advance policy objectives.

8. Digital Health Systems Governance Ecosystem in India

India needs to implement proactive policy initiatives to incorporate advanced digital diagnostics and therapeutics, ensuring their alignment with the existing 'Artificial Intelligence (AI) Policy',[12] The prevailing AI policy in India acknowledges the potential and challenges within the healthcare sector, especially in determining future strategies. Proposed design principles are outlined below, offering recommendations for India to integrate them into its governance policy for digital health systems.

1. Encourage the progress of local or decentralized innovations in health technology, while safeguarding technological sovereignty and independence.

2. Identify and prioritize specific applications tailored for India, taking into account existing infrastructure limitations and resource constraints to ensure practical and efficient implementation.

3. Give precedence to patient safety by establishing regulatory frameworks for the clinical validation of digital diagnostics and therapeutic products and services. Address issues of algorithmic bias and inappropriate representations in training models.

4. Instill trust and confidence in health service providers and users to adopt and integrate new technologies through the provision of robust decision support systems.

Substantiate this with findings from validation studies conducted in clinical trials and real-world scenarios, clearly demonstrating their utility.

5. Highlight transparency, data confidentiality, cyber security, and ethical considerations as fundamental elements for innovation and practical application. Develop operational manuals and guidelines for health data usage by medical software developers, with a focus on transparency and safeguarding the rights and confidentialities of patients.

The implementation of digital health-focused guidelines is poised to significantly transform the governance of existing health systems. It is imperative to optimize the benefits derived from public goods, products, and services within this domain while minimizing any potential disruptions. Policy interventions should align with the set of nine values advocated by the "United Nations Secretary General's panel on digital cooperation" (UN);[13]

1. Accessible Healthcare: Ensuring healthcare is straight forward, reliable, and affordable for everyone.
2. Collaboration: Fostering cooperation and joint development efforts.
3. Human-Centered Design: Creating healthcare solutions with a focus on human well-being and accountability for results.
4. Human Flourishing: Encouraging sustainable growth that contributes to social welfare.
5. Harmony: Promoting sincere collaborations between governments and businesses to prevent conflicts.
6. Inclusivity: Providing equal opportunities for access to quality healthcare and equitable outcomes.
7. Respect: Upholding considerations for human dignity, privacy, and legal standards.
8. Sustainability: Advocating for best practices to achieve a zero-carbon and zero-waste economy.
9. Transparency: Avoiding information black-boxes and promoting openness in healthcare practices.

9. Way Forward

In today's globally interconnected world, the challenges of health, healthcare, and health systems governance transcend national borders. Digital health systems governance is rapidly emerging as a defining trend of this decade, exerting a significant influence on geopolitical and socioeconomic realities. India has a crucial role to play in shaping global health policies and governing digital health ecosystems in a progressive manner. The 'National Digital Health Blueprint' holds the potential to help India achieve 'Sustainable Development Goals' and strengthen national health systems through integrated digital health governance (NDHB).[14,15]

The NDHM (National Digital Health Mission) is a strategic opportunity for strengthening of functional health systems on the ground but this will need people connects clarity in the role for Panchayati Raj Institutions (PRIs) and urban local bodies, to the primary health centers, and sub-centers at the grassroots level.[16] The Panchayati Raj Institutions, civil society organizations especially the Community Based Organizations, the ASHAs, ANMs, and Anganwadi workers must have the accessibility of the fast provider with health records as available within the framework of NDHM. Public information system, community connect, on the job handholding and use of technology as multiple means of accessibility will facilitate in making the fast point of primary health care [health and wellness centers (HWCs), primary health centers (PHCs) and Community Health Centers (CHCs) with a medical officer in place] can very well act as the gate keeping role for even secondary and tertiary level of referrals within the functioning of district health systems.[17]

By initiating a sustainable regulatory framework and fostering an enabling ecosystem, the Blueprint presents a strategic opportunity for India to advance its mandates for health systems strengthening and improve health outcomes. An effective digital transformation ecosystem is essential for addressing complex, system-wide changes requiring national-level leadership and sustained investment.[18] Anticipated digital transformation opens doors to creating highly effective, efficient, and people-centered functional health systems. Seizing these opportunities demands strong political will and the effective alignment of national health policies. It is imperative to "Act Now and Act Fast" to overcome the challenges of transforming health systems in the 21st century, progressing towards achieving UHC under the Sustainable Development Goals by 2030.[19,20]

10. Source of Funding

None.

11. Conflict of Interest

None.

References

1. ISO/TR 14639-1:2012 Requirements of eHealth Architecture and COBIT 5.
2. No.51 ADB Sustainable Development Working Paper Series.
3. Different institutions use different sets of principles. An overview can be found in. Available from: http://www.who.int/universal_health_coverage/plan_action-hsgov_uhc.pdf?ua=1..
4. World Bank, United States Agency for International Development, and WHO. Health Measurement and Accountability Post 2015: Five-Point Call to Action. Available from: http://www.searo.who.int/entity/health_situation_trends/5-point-call-to-action.pdf?ua=1..
5. National Health Policy (2017), Ministry of Health, Government of India.
6. Towards a Holistic Digital Health Ecosystem in India," ORF Issue Brief No.351, April 2020, Observer Research Foundation.
7. (NDHB 2020) National Digital Health Blueprint, Ministry of Health and Family Welfare, GOI.
8. GBD. Healthcare Access and Quality Collaborators, "Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a

systematic analysis from the Global Burden of Disease Study. *Lancet*. 2016;p. 2236–71.
9. The Lancet 391, no. 10136 (2 June 2018): 2236–71.
10. National Health Policy," Ministry of Family Health and Welfare, Government of India.
11. WHO Guideline, "Recommendations on Digital Interventions for Health System Strengthening," 2018.
12. National Digital Health Blueprint," Ministry of Family Health and Welfare, Government of India, January 2020.
13. The Age of Digital Interdependence," UN Secretary-General's High-level Panel on Digital Cooperation, June 2019.
14. Press Release, Ministry of Electronics and IT, Government of India; 2019.
15. Following the Equator – A Journey Around the World; 1987.
16. Broadband Commission Working Group on Digital Health. Digital Health: A Call for Government Leadership and Cooperation between ICT and Health.; 2017. Available from: http://www.broadbandcommission.org/Documents/publications/WorkingGroupHealthReport-2017.pdf.
17. WHO/ITU. National eHealth Strategy Toolkit Overview. Available from: http://www.who.int/ehealth/publications/overview.pdf?ua=1..
18. WHO. 2016. Global Observatory for eHealth, Global Diffusion of eHealth: Making Universal Health Coverage Achievable.; 2020. Available from: http://apps.who.int/iris/bitstream/10665/252529/1/9789241511780-eng.pdf?ua=1..
19. A description of all these components is in the WHO and ITU National eHealth Strategy Toolkit.; 2019. Available from: https://www.itu.int/dms_pub/itu-d/opb/str/D-STRE_HEALTH.05-2012-PDF-E.pdf..
20. World Bank, United States Agency for International Development, and WHO. Health Measurement and Accountability Post 2015: Five-Point Call to Action. Available from: http://www.searo.who.int/entity/health_situation_trends/5-point-call-to-action.pdf?ua=1..

Author biography

Manoj Kar, Professor https://orcid.org/0000-0001-5293-9878

Sipra Ram, Assistant Professor https://orcid.org/0000-0001-6957-2101

Cite this article: Kar M, Ram S. Digital governance in transforming health systems and health policy in India. *J Community Health Manag* 2024;11(1):6-12.