

INNOVATION IN INDIAN HEALTHCARE

Abstract

Recent developments in science and technology as well as research about the health sector have been on the rise, it has further underlined how innovation in healthcare is not only a buzzword but also the future of healthcare. However, it is important to understand what is innovation in the healthcare sector conceptually and how it is important to Indian healthcare. Healthcare as a field and a sector has been continuously changing and evolving. Although there has been no concise and standard definition of the term “**innovation in healthcare**”, however, the common and widely accepted understanding is that innovation in healthcare is closely associated with newer developments in the field of healthcare to denote better and more effective solutions to existing and anticipated healthcare problems. Conceptually innovation is categorized based on its impact on the stakeholders ideally bifurcated into two theoretical categories such as:

- **Non-disruptive innovation**
- **Disruptive innovation**

Similarly, a study by UNESCO Institute for Statistics in 2005 identified four types of categories of healthcare innovations. They are

- **Product innovation**
- **Process innovation**
- **Marketing innovation**
- **Organizational innovation**

Historical literature from India argues that the Indian healthcare system has had evidences of innovation in ensuring health and sanitation to the public since the earliest ages. Some scholars argue

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that the clay drainage systems and public bath spaces since 238 BCE were the first instances of using innovation in ensuring healthcare of the people. AYUSH and other traditional systems and generational practices of understanding illness and addressing healthcare (as is evident in texts like Sushruta Samhita) have also since then, been seen as innovative grounds that paved the way for healthcare service delivery in India.

However, innovation in Indian healthcare also still suffers from logistical and standardization challenges. Although the current focus has been on process optimization and inclusiveness to ensure cost effectiveness and long-term sustainability, further work needs to happen in terms of strengthening Information Communication Technology (ICT) to formulate and maintain a fully functioning effective national database. This would not only aid HMIS practices within service providers on a national level thus, bettering health outcomes and ensuring effective monitoring and functioning of services provided but also help in better policy implementation and highlighting the way forward to an inclusive policy that is accessible to all.

Keywords: Innovation in health, Innovation in healthcare, Healthcare innovation, Disruptive innovation in healthcare, Non-disruptive innovation in healthcare, Innovation in Indian healthcare

I. INTRODUCTION

In a world marked by an ongoing global pandemic such as the Coronavirus or Covid-19, much focus has been shifted towards looking at and analyzing how nations have managed their health sector in terms of its healthcare service provisioning. This has highlighted the growing need for innovation in the healthcare sector not only in India but across nations to promote inclusiveness in healthcare delivery. Recent developments in science and technology as well as researches about the health sector has been on the rise, it has further underlined how innovation in healthcare is not only a buzzword but also the future of healthcare. However, it is important to understand what is innovation in the healthcare sector conceptually and how it is important to Indian healthcare.

II. BACKGROUND - WHAT IS INNOVATION IN HEALTHCARE?

Healthcare as a field and a sector has been continuously changing and evolving. Although there has been no concise and standard definition of the term “innovation in healthcare”, however, the common and widely accepted understanding is that innovation in healthcare is closely associated with newer developments in the field of healthcare to denote better and more effective solutions to existing and anticipated healthcare problems. This may be in the form of policies, systems, technologies, ideas, processes, services and products. However, innovation is more than just the next step of healthcare. The World Health Organization (WHO) explains that ‘health innovation’ is a key tool to facilitate improvement of efficiency, effectiveness, quality, sustainability, safety and access or affordability of healthcare that aims to solve pertinent social issues thereby enabling health to all populations.¹ The goal of operationalizing healthcare innovation is to improve the ability to meet public and personal healthcare needs and demands by optimizing the health systems, thereby ensuring diagnosis, treatment, preventive behaviors, awareness, outreach, quality access, education, and research and service delivery to empower populations and promote healthy behaviors.

Past literary works such as those of Zaltman et.al (1973) indicate that the term “innovation” has been borrowed from the business world and is used to denote business productivity and competitive survival. As such, innovation in healthcare was first adopted as a process to balance cost containment and healthcare quality.²

Likewise, the most widely accepted understanding of innovation in healthcare is defined as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to specifically benefit the individual, group or the wider society” (West 1990)³. It is argued that this definition of innovation in healthcare has been accepted widely in the field as it addresses three most important characteristics of innovation which are –

1. Novelty (product element of healthcare),
2. An application component as a solution to existing problems (process element of healthcare innovation), and
3. An intended benefit as an outcome⁴(as a way to address structure element of healthcare innovation).

III. CATEGORIZING HEALTHCARE INNOVATION

Conceptually innovation is categorized based on its impact on the stakeholders ideally bifurcated into two theoretical categories such as:-

- 1. Non-disruptive innovation:** It is also called incremental, evolutionary, linear or sustaining innovation that seeks to improve and build on existing systems and problems to allow expanded opportunities and interventions to be met/employed as part of problem solving strategies. For example: Medical teams who study and work in the specialized department of Medicine in a hospital system exclusively are now being super specialized into family medicine and other sub-specializations instead of a generic broad department.
- 2. Disruptive innovation:** It is also called radical, revolutionary, transformational and non-linear innovations that cause a disorder to old systems, create new players/actors/stakeholders, and new markets while marginalizing the existing systems to deliver dramatic value to stakeholders who successfully implement and adapt to the innovation and a new normal. For example: Usage of technology to aid preventive care such as using Fit bits and step counter mobile applications while exercising as a way to stay healthy etc.

Similarly, a study by UNESCO Institute for Statistics in 2005, identified four types of categories of healthcare innovations. They are –

- **Product innovation:** This entails a good or a service which is significantly new and improved in technical specifications, components and materials along with better incorporated software with user friendliness with respect to its intended use. For example: Wearable heart monitors, portable and instant blood sugar monitoring devices like Accu-check etc.
- **Process innovation:** This refers to effective implementation of a new or improved production and delivery method to cater to all stakeholders. The consumer or end user does not directly pay for the process, but the process is required to deliver a product or service and to manage the relationship between the stakeholders. For example: In case of India, one can say Ayushman Bharat Yojana is a good example of process innovation to ensure healthcare access through the strategy of innovative insurance linkages to the public. Another example can be using Big data to manage and aid pandemic vigilance of a nation like India as in the case of national total of positive Covid-19 cases in the year 2020 alone.
- **Marketing innovation:** Usually involves implementation of newer and creative strategies or methods to ensure maximum sale and use based on significant changes in the product design, placement, promotion and pricing. For example: Comprehensive package-based diagnostic blood tests such as Complete Blood Count (CBC) test to screen anemia, infections, antibody levels, possibility of blood cancer etc.
- **Organizational innovation:** It essentially involves new and effective organizational

and structural method to address existing gaps in workplace and external relations as well as functioning. For example: Decentralization of healthcare service delivery into Primary, Secondary, Tertiary and Quaternary care institutions as part of ensuring public health in India. Or uniformity in terms of hospital protocols and organizational structure across chain private hospital agencies like Apollo, Fortis etc.

As multi-dimensional as it sounds, it is important to understand the stakeholders that healthcare innovation caters to, before we look at India specific healthcare strategies.

Table 1: Stakeholders in the Innovation Process

Stake Holders	Needs, Wants & Expectations
Physicians and Other Care Givers	Improved clinical outcomes, improved diagnosis and treatment
Patients	Improved patients' experience, improved physiological well-being, reduced waiting time, reduced delay
Organizations	Enhanced efficiency of internal operations, cost containment, increased productivity and quality and outcomes improvement
Innovator Companies	Profitability, improved outcomes
Regulatory Agencies	Reduced risks and improved patient safety

Image source: Omachonu V, Einspruch N. Innovation in Healthcare Delivery Systems: A Conceptual Framework. *Innov J.* 2010;15(1):1-20.

IV. INDIAN HEALTHCARE INNOVATION

Historical literature from India argues that the Indian healthcare system has had evidences of innovation in ensuring health and sanitation to the public since the earliest ages. Some scholars argue that the clay drainage systems and public bath spaces since 238 BCE were the first instances of using innovation in ensuring healthcare of the people. Scholars specializing on subaltern studies and marginalization also argue that innovation in the form of bamboo pipeline networks in the hill areas, and has been integral part of tribal and indigenous health systems and traditions since much before. AYUSH and other traditional systems and generational practices of understanding illness and addressing healthcare (as is evident in texts like Sushruta Samhita) have also since then, been seen as innovative grounds that paved the way for healthcare service delivery in India. Post the independence era, India's heavy focus on economic and political strengthening however, put healthcare priorities to the back burner which caused ripple effects of widespread health disparity, low nutrition, high mortality and ineffective population management as well as inequitable access to healthcare. Though efforts were made to understand and address healthcare access through the national

health policies, structuring of the Government Departments into Ministry of Health and Family Welfare, Water and Sanitation, Women and Child Development, etc., structuring the targeted vertical programs to Address specific diseases with a high burden, it was marked by issues of availability of resources and manpower which resulted in heavy reliance on private healthcare providers and equitable access to health care facilities and high out of pocket expenditures for the people, irrespective of their socio-economic status. It is abysmal to realize that India has an average of 0.6 doctors for every 1000 people as compared to the global average of 1.23 (CII & Technopak Advisors Ltd, 2011)⁵. What is even more appalling is that the rural doctor to population ratio is lower by six times as compared to urban areas, showing a much higher concentration of healthcare institutions available to the urban rich class rather than the poor. A Confederation of Indian Industry (CII) Technopak study also highlights that there is a shortfall of over 900,000 physicians and 250,000 nurses in the country (WHO, 2012)⁶.

The Covid-19 pandemic further accentuated how India needs more innovative healthcare to strategies proper usage and management of health service delivery. A growing need to reach more people and empower them to access affordable quality healthcare facilities (be it public or private or partnered) has been the demand of the hour. This has been the driving force to push for more innovation in the healthcare industry and service provisioning in India to achieve better basic healthcare indicators. Healthcare service delivery in the last decade in India has seen the emergence and engagement of newer actors to bring forth an ‘affordable health revolution’ in the country. The focus of these pioneering private and non-governmental healthcare organizations has been to ensure basic curative care facilities to the under-served populations in the country through creative models, such as private actors providing 70% of the ambulatory care services by Ziqitsa Healthcare Ltd. Providing 1298 Ambulatory services in the healthcare market to populations in India, especially in remote areas on a pay-per-fee model. This has especially been hailed as a boon for people residing in rural and remotest geographical areas especially during disaster situations such as in states of Assam, West Bengal and Chennai where Boat-and-Motorcycle ambulances catered to the emergency cases and encouraged institutional health access in the community.

Another impressive model has been the not-for-profit CARE Rural Health Mission operating in states of Andhra Pradesh and Maharashtra which anchoring telemedicine services by linking trained community health workers to remote physicians at primary care clinics and hospitals, thereby encouraging capacity building in the community and facilitating a health network formation. Other important service providers that aid community care and health financing include Appollo Clinics, Healing Fields, Vatsalya and Aarogya Parivar who have catered to majority population in South Indian and East Indian states to primarily facilitate health education, health savings and micro-community insurance through the Self-Help Group Model, thereby fuelling e-learning and mobile technological support in the communities. Similarly few other innovative models of healthcare delivery in India that have gained recognition for their efforts are the chain of Aravind Eye Care Hospitals and the Narayana Hrudayalaya Institute of Cardiac Sciences and Hospitals, Thyrocare, Dr. Mohan’s Diabetes Speciality Center etc. which offer specialized care services to address the nation’s NCD burden of a rapidly urbanizing and aging population. Telemedicine services has emerged as a major enabler of healthcare and much of the newer innovation models in the market have have been brought about through both public and private partnerships. A few

examples of these can be E-Health points or through the application called M-Health and the Government of Gujarat aided E-Mamta initiative that has created one of the country's largest and unfortunately only breast milk banks across the state to tackle under-nutrition of newborns. Government of Bihar and NRHM's joint efforts via the Muskaan: The Smile Campaign has also been instrumental to ensure routine immunisation in terms of coverage and has been appreciated as part of best practices in the country. Likewise, when it comes to product innovation, India has become a key player one of the largest manufacturers of generic drugs and has laid the groundwork to encourage actors like Jaipur Foot, Ayzh, Biosense, Embrace and Jeevan Blood Banks as pioneers into the prosthetics and support product markets that has been lately growing. This not only proves the nation's capability to perform well in terms of Research and Development and Manufacturing to aid further innovation but also hints at the mammoth potential it possesses if public policy on healthcare accommodates them better in the future. However, innovation in Indian healthcare also still suffers from logistical and standardization challenges. Although the current focus has been on process optimization and inclusiveness to ensure cost effectiveness and long term sustainability, further work needs to happen in terms of strengthening Information Communication Technology (ICT) to formulate and maintain a fully functioning effective national database. This would not only aid HMIS practices with in service providers on a national level thus, bettering health outcomes and ensuring effective monitoring and functioning of services provided but also help in better policy implementation and highlighting the way forward to an inclusive policy that is accessible to all.

REFERENCES

- [1] World Health Organization. Innovation. 2016. Available at: <http://www.who.int/topics/innovation/en/>. Last accessed: 23 December 2020.
- [2] Zaltman, G., Duncan, R. and Holbeck, J. (1973) *Innovation and Organizations*. John Wiley, New York, 45-68.
- [3] West, M. A. 1990. The Social Psychology of Innovation in Groups. Pp. 309-334 in M. West & J. L Farr (eds.), *Innovation and Creativity at Work: Psychological and Organizational Strategies*. Chichester, UK: Wiley.
- [4] Gopalakrishnan L, Buback L, Fernald L, Walker D, Diamond-Smith N, in addition to The CAS Evaluation Consortium (2020) Using mHealth to improve health care delivery in India: A qualitative examination of the perspectives of community health workers and beneficiaries. *PLoS ONE* 15(1): e0227451. <https://doi.org/10.1371/journal.pone.0227451>
- [5] Lehoux, P., B. Williams-Jones, F. Miller, D. Urbach, & S. Tailliez. 2008. What leads to better health care innovation? Arguments for an integrated policy-oriented research agenda. *Journal of Health Services Research & policy*, 4(13): 251-254.
- [6] Omachonu V, Einspruch N. Innovation in Healthcare Delivery Systems: A Conceptual Framework. *Innov J*. 2010;15(1):1-20.
- [7] Labrique AB, Vasudevan L, Kochi E, Fabricant R, Mehl G. mHealth innovations as health system strengthening tools: 12 common applications and a visual framework. *Global Health Science Journal*.2013; 1:160–171. <https://doi.org/10.9745/GHSP-D-13-00031> PMID: 25276529
- [8] Dutz, M. A. 2007. *Unleashing India's Innovation: Towards Sustainable and Inclusive Growth*. Washington, DC: The World Bank.
- [9] National Innovation Council. 2010. *Decade of Innovation*. Government of India: National Innovation Council.
- [10] Srivastava S.C., Sainesh G., 2015. Bridging the Service Divide Through Digitally Enabled Service Innovations: Evidence from Indian Healthcare Service Providers. Page Numbers: 245-267, *MIS Quarterly Journal*. Retrivable at

- [11] <https://misq.org/bridging-the-service-divide-through-digitally-enabled-service-innovations-evidence-from-indian-healthcare-service-providers.html>

ONLINE SOURCES

- [12] <http://nhsrindia.org/resource-detail/sector-innovation-council/NDcz>
- [13] <https://www.investindia.gov.in/team-india-blogs/how-indias-healthcare-sector-pioneering-innovation>
- [14] <https://blogs.deloitte.co.uk/health/2017/02/lessons-from-india-how-innovation-is-transforming-healthcare-in-india.html>
- [15] <https://www.expresshealthcare.in/blogs/guest-blogs-healthcare/an-era-of-overdue-innovation-and-digital-transformation-in-healthcare/424240/>
- [16] <https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-018-0092-5>
- [17] <https://www.thehindu.com/opinion/lead/powering-the-health-care-engine-with-innovation/article30854153.ece>
- [18] <https://qz.com/india/1331574/indias-doctors-are-driving-health-care-innovation/>
- [19] <http://bwhealthcareworld.businessworld.in/article/Indian-Healthcare-s-Innovation-Imperative-Technology-Beyond-Telemedicine/18-11-2019-179108/>
- [20] <https://www.imd.org/news/updates/Why-India-is-poised-to-become-a-world-leader-in-healthcare-innovation/>
- [21] <https://time.com/5710295/top-health-innovations/>