

Innovative Healthcare Practices in India- The hidden Opportunities in the Indian Healthcare Industry



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The Healthcare sector is growing rapidly and is now one of major sectors in India. However, regardless of some developments, India's healthcare sector deals with a surfeit of challenges. India's competitive gain lies in its large pool of well-trained medical professionals and the government policies, which are able to help the innovations that will focus on an Indian model to achieve inclusive growth. There has also been an emergence of "frugal innovation" in the private sector that successfully makes use of the pool of well-trained medical professionals. Therefore, this paper attempts to understand the robust, innovative design adopted by Indian hospitals to improve the quality, affordability, and coverage of healthcare.

Keywords: Innovation, Healthcare Practices, Frugal, Hub-and-Spoke Design, Task-Shifting

1. Introduction

The Healthcare sector is growing rapidly and has emerged as one of major sectors in India, both in terms of income and service. The health sector in India is growing at a brisk pace due to its strengthened coverage and services offered. The expenditure by the public as well as private players is also increasing and the sector is expected to grasp \$372 billion by the year 2022 (National Investment Promotion and Facilitation Agency, 2019).

However, despite the advances, India's healthcare sector deals with a surfeit of challenges. In spite of vigorous fiscal growth over the past few years, the infant mortality rate is much higher than the other developing countries (World Bank Data). India currently spends a little over 1% of GDP on health (National Health Profile, 2018; World Bank Data), and 67.78% of total expenditure on health in India was paid out of pocket (WHO, 2017). India's competitive advantage lies in its large pool of well-trained medical professionals and the number of doctors, which in India meets the global average. However, 74 % of India' doctors cater to a third of the urban population, which means a shortage of doctors at village community health centers (CHCs) (KPMG report, 2017).

2. Rationale for the Study

Even though Indian healthcare has made rapid strides in healthcare, basic issues of affordability, availability, and quality of care continue to affect a large section of the

population. Moreover, driven by the pressure of increasing cost and reducing margins, Indian healthcare providers are also grappling with challenges of improving productivity and efficiency of healthcare services. The enormity and multiplicity of the challenges faced by the Indian healthcare sector demands for a large-scale involvement that can yield anticipated results, in a timely fashion. It is therefore, necessary for Indian healthcare system to adopt a large scale, comprehensive as well as an out-of-the-box approach which can act as potential catalysts to address the complex challenges. The incentives are provided as innovative models and government policies. Moreover, adoption of innovative techniques is gradually becoming a standard across sectors including healthcare. There are plenty of opportunities available to implement innovative models in Indian healthcare system. With nearly four billion people (or almost two-thirds of the world's population) living at the below poverty line, innovation to support affordable access to quality healthcare services is particularly essential. Moreover, necessity progenies innovation (Govindarajan & Ramamurti, 2013). Challenged with the limitations of deficiency and a severe shortage of resources, the Indian healthcare institutions have had to operate more agilely and creatively to serve the vast number of people (Shi and Singh, 2017). As the out of pocket expenditure is high in India, healthcare organizations must deliver value. Thus, the Indian healthcare system have devised new ways of providing world-class health care affordably and has emerged as nerve centre for innovations in healthcare. Moreover, the National Innovation Council encourages a culture of innovation in India and changes that will focus on Indian model for inclusive growth. Subsequently, value-based war is not a hallucination but a reality in India. These innovative models create a revolution or a radical change in usual systems and they include policies, processes or products that have influenced the Indian healthcare industry trends or have contributed towards achieving its goals. In recent past, a number of such prominent innovative models have emerged in Indian healthcare industry and it is important to understand and analyse these models. Therefore, this paper attempts to understand the powerful Indian models for inclusive growth and the innovative designs adopted by the healthcare institutions to improve the quality, affordability, and coverage of healthcare.

3. Data Sources and Research Methodology

The present study is an exploratory analysis based upon secondary data. Sources of data collection are published Peer Reviewed Research Papers, News Articles in reputed journals, Ministry of Health and Family Welfare, Government of India, National Human Development Report, Planning Commission, Government of India and Population Census of India, World Health Organization Reports, and World Health Statistics.

4. Innovative Models Adopted by the Indian Healthcare Institutions

Healthcare institutions functioning in an industry are characterized by continuous changes. These changes are due to the convergence of numerous influences from both within and outside of the given establishments (Jamison. and Martin, 2001; Shi and Singh, 2017). To successfully navigate through a free environment of innovative

designs in healthcare, healthcare providers should be proficient in multiple areas including how they organize and deliver services ((Porter & Lee, 2013; Govindarajan & Ramamurti, 2013; Devarakonda, 2016). In order to reach their dual commitments to high quality and ultralow cost, the Indian healthcare institutions have developed robust, innovative designs like a hub-and-spoke design, task-shifting and frugal innovation (Govindarajan and Ramamurti, 2013). These models majorly have helped the Indian healthcare institutions to cut costs while still improving their quality of care.

4.1 A Hub-and-Spoke Design

The hub-and-spoke model provides a network comprising of the main campus and one or more satellite campuses, offering a high potential for serving patients well (Ahlquist et al. 2012; Porter & Lee, 2013; Govindarajan & Ramamurti, 2013). The Indian healthcare institutions have adopted the method of airlines to reach out to remote areas and they have created hubs in major metro areas and small clinics in rural areas that directed patients to the main hospital. The hub and spoke model is a highly synchronized network which reduces the cost. The cost-cutting is achieved by centralizing the costliest equipment and specialists in the hub instead of replicating it in all the spokes (Porter & Lee, 2013). The model is highly scalable with satellites being added as needed or desired (Ahlquist et al., 2012; Roney, 2012). When any physical distance makes satellite-to-hub access unworkable, an extra hub can be formed, providing a multi-hub network (Govindarajan and Ramamurti, 2013). According to Dunn (2017), the model is much more efficient than organizational designs that reproduce operations across multiple sites. The success stories of Indian hospitals such as Vaatsalya Healthcare, Aravind Eye Care System, Narayana Health, HCG - Healthcare Global Enterprises Ltd etc. prove that a well-designed hub-and-spoke network satisfies the patients. The model assures and nurtures resource maintenance, profit, service excellence, and enhanced market coverage (Devarakonda, 2016; Ahlquist et al., 2012; Roney, 2012).

4.2 Task-Shifting

Task-shifting is the process of delegating appropriate tasks to less specialized health workers having shorter training and fewer qualifications. It helps to improve healthcare coverage by making efficient use of the human resources already available. It also increases capacity while training and retention programs are expanded and helps to address the current shortages of health workers (WHO, 2008). This model helps to overcome the deficit of highly skilled specialists by allowing specialists to handle only the most critical technical procedures. Such hospitals have become incredibly productive and they maximize their efficiency by increasing the number of support staff, fundamentally extending the reach of specialists. Another form of task-shifting is self-service, where patients and family members take over tasks traditionally performed by hospital staff. The task-shifting models are present in the public sector as well as in the private sector.

4.2.1 NGO (Non- Governmental) Models

Community Health Workers (CHW): CHWs serve as an important link between underserved societies and large health systems (Lehmann and Sanders, 2007). They

serve as an extension of the existing workforce or they serve as intermediaries strengthening community participation in accessing, demanding, and engaging with health systems. This model helps to shift the primary health services from specialist doctors to CHWs. (Saprii, et. al., 2015; Witme, et. al., 1998).

SEARCH (Society for Education, Action, and Research in Community Health): SEARCH is a non-governmental organization set up in 1985 renowned for its pioneering work in home-based neonatal care and it operates through its 'Shodh Gram' hospital. The model entirely depends on the members of the community performing health interventions that are specific to issues identified by the community. (Bang et al., 2005). It empowers village women to use basic medical knowledge and skills to look after their new-borns and it is well known example of task-shifting model (Bang and Bang, 2005).

MAHAN: MAHAN is a registered non-governmental organization(NGO) working in Maharashtra, India, established in the year 1998 which works to provide health care service to the people of Melghat, especially to the tribal communities. They have started a rural hospital, home-based childcare, community-based management of malnutrition, mortality control program for chronic diseases, blindness control program, and a counselor program. The home-based childcare program trains tribal women to diagnose and treat the leading causes of under-5 mortality (Bang & Bang 2010, WHO, 2008). Their training program includes two years of rigorous training for four days a month and a two-day refresher course every two months (Balsari et. al., 2017). MAHAN also helps to shift the basic health services from specialist doctors to less skilled tribal women.

SANGATH: It is a non-governmental, not-for-profit organization in Goa committed to serving the community as lay mental health counselors to treat depression, addiction, and youth development. The Sangath Volunteers undergo training of three weeks, followed by a six-month internship in identifying, addressing, and providing solutions to those suffering from moderate to severe depression. (Chowdhary et al., 2016). These types of task-shifting models in mental health can address both the workforce and cultural barriers effectively and are cost-effective and cost-saving (Patel, 2015).

Swayam Shikshan Prayog (SSP) or Arogya Sakhi model: It is non -profit organization in western Maharashtra, which trains women (known as Arogya Sakhis) who have primary education and are interested in healthcare to conduct basic medical tests using mobile health devices and to capture and upload the data by using a tablet, for expert's consideration. Based on the test reports, these women guide the patients, and if needed, they refer the patients to specialist doctors and hospitals (Balsari et al., 2017). Arogya Sakhi model is a well-known task-shifting model.

4.2.2 Government Models

India's community based public healthcare includes three crucial programmes: Anganwadi worker, ASHA worker, and the Auxillary nurse-midwife (National Rural Health Mission Report, 2012). All these programs have leveraged women from the community to close delivery gaps, especially for maternal and child health.

Auxiliary Nurse Midwife (ANM): They are the multipurpose workers who attend to child health and basic curative care for villagers. They are trained in a variety of

clinical skills, including recognizing high-risk pregnancies, conducting regular deliveries, assessing and caring new-born's, contraception counselling, cervical cancer detection, and primary care and resuscitation of the new-born (Mavalankar and Vora, 2008, NRHM, 2012).

Anganwadi Worker (AWW): Their role is to address child health needs in the 0-6 age group (Ministry of Women and Child Development, 2012). They work through a network of over one million Anganwadis and government-sponsored childcare centers across India, serving a community of 58 million children and over 10 million pregnant or lactating women (Desai et al., 2014, Anganwadi website). In contrast to the ANM, the AWW has no formal education requirements.

Accredited Social Health Activist (ASHA): They include women volunteers who serve as health activists, community mobilizers, and essential care providers (National Health Mission Guidelines, 2013). ASHA's volunteers undergo a 23 day nationally endorsed training course to acquire basic competencies to educate communities on health practices. The services include mobilizing communities to use existing health services, conducting home visits to identify complications and illness, distributing vitamins, dietary supplements, and certain medications (National Health Mission, 2010). They work closely to collaborate on mobilization and awareness-raising campaigns. According to Desai et al. (2014), the ASHA program had an overall positive impact on rural healthcare utilization.

Mid- Level Providers: The government encourages the task shifting of higher-level skills through the creation of a new cadre of mid-level providers and the re-training of existing staff in specialized skills. Mid-level caregivers are quickly deployable and are a less expensive option to train without sacrificing the quality of care (National Health Mission, 2013).

Comprehensive Rural Health Project (CRHP): Founded in 1970, CRHP, the Jamkhed model is a holistic approach to primary health care at the community level. It guides the public to use simple tools, adapted to the local context to address priority health needs. The innovation of this approach lies in involving the communities themselves, especially those who are poor and marginalized, in designing their health and development programs. Moreover, the 'health messengers' (known as arogyadoots) visit the remote villages and train and help them. Hence, they pass on their knowledge to others and empower the entire community (National Health Mission, 2016).

4.2.3 Hospital-based Models

Apart from the models described above, to effectively serve people who do not have access to specialized care, some private hospitals implemented the task-shifting models.

Aravind Eye Care: They have used task-shifting to expand business operations and have increased their reach (Aravind Eye Care System: Activity Report, 2016; Rangan and Thulasiraj, 2007). The unique cadre of "Ophthalmic Assistants" (young women from surrounding villages who had a few years of formal schooling) helped the hospital to maximize the efficiency and reduce the cost of surgeries by shifting specific responsibilities from surgeons to "Ophthalmic Assistants" (Scott, 2013). These women were trained to evaluate eye function, perform panels of tests, prepare

patients for surgery, finish post-operative procedures, and educate the patients about the care and follow up. (Natchiar, 2001).

Narayana Health (NH): NH uses surgical care task-shifting to provide high quality affordable and efficient cardiovascular solutions, simultaneously reducing costs (Richman et al., 2008). NH trains the junior surgeons to conduct several steps of the complex heart surgery, allowing the senior surgeon performing the critical steps. Moreover, the co-location of simultaneous operations enables the specialist to be involved in more than one surgery at a time. Through this system, the junior doctors get excellent training which also reduces the cost considerably (Richman et al., 2008).

4.3 Analysis of Frugal innovation Practices in the Sample Hospitals

Though, frugality may be considered an ancient concept, the term frugal innovation was coined only recently in the management literature (Bound & Thornton, 2012; Hart & Christensen, 2002; Kanter, 1999; Petrick & Juntiwassarakij, 2011; Prahalad & Mashelkar, 2010; The Economist, 2010). A significant driver for these innovations is the considerations of un-met customer needs faced in developing markets with large populations, pertinent health issues, and low income per capita (Lim, Han, & Ito, 2013; Anderson & Markides, 2007; Kanter, 1999; Prahalad & Mashelkar, 2010; Svensson, 2001). Moreover, inefficiency is seen as fundamentally contributing to rising costs and the need for more economically efficient solutions (Christensen, Bohmer, & Kenagy, 2000; KPMG, 2012). Rather than mere efficiency improvements, such models represent radical reconceptualization of the provision of services that are informed by principles of affordability to even the most unfortunate consumer. It also represents adaptability to local cultural conditions, availability through easily accessible channels, and promotion by educational awareness building (Anderson & Markides, 2007; Hart & Christensen, 2002; Kanter, 1999; Prahalad & Mashelkar, 2010). The efforts to prolong the working life of expensive technology through careful maintenance and repair and the 'reuse of medical devices sold as single-use products' (such as steel clamps employed during beating-heart surgeries) are all examples of frugal innovation. The successful hospitals who had adopted the frugal innovation practices (Table 1) to increase the efficiency are discussed in the following paragraphs.

Aravind Eye Care: A senior surgeon executes 6-8 surgeries every hour with the help of two nurses (Vickers & Rosen, 2011). This kind of efficiency is achieved by the systematic arrangement of the workflow of the surgeon and the nurse (Rangan and Thulasiraj, 2007). With the help of standardized operations and a highly efficient assembly line method, an Aravind surgeon performs about 2,000 surgeries annually in comparison to the 200 elsewhere in the country on an average. (Natchiat et al., 2008; Vickers & Rosen, 2011). Aravind has signed a technology-transfer agreement with the Florida-based IOL International and set up a company in southern India, Aurolab, to manufacture intraocular lenses, comparatively at a lesser cost (Vickers & Rosen, 2011).

Moreover, Arvind follows better human resource practices than others and it has a disciplined and motivated set of staff who supports vertical integration well (Rangan and Thulasiraj, 2007). The human resource practices at Arvind include structured 'in-house training', 'training and empowering' women from villages who have only

primary educations as mid-level ophthalmic personnel, and ‘continuous learning’ to widen the skills (Rangan and Thulasiraj, 2007; Rani, 2011). According to Rani (2011), Arvind also follows the target management practices like the unique service-oriented model in which free treatment is provided to those who cannot pay. An affordable treatment is provided to others. Moreover, they follow a unique recruitment process. The hospital never advertises commercially, but they announce the personnel needs during camps and recruits personnel through the referrals of employees.

Narayana Hrudalaya: NH focuses on process innovation and uses already available information technology tools like telemedicine to reach out to the masses and make treatment faster and cheaper. NH’s joint venture with Indian Space Research Organization (ISRO) provides them satellite connectivity, which connects over 100 telemedicine centers across the country and receives 250 ECGs every day from remote locations in India and Africa (Singh et al. 2011). Moreover, instead of purchasing expensive diagnostic equipment, NH made a deal, “pay-per-use” with equipment providers. Since the volume of patients is enormous, the providers are happy to offer such schemes. NH infuses cost awareness across the organization in many ways. It also motivates the doctors to suggest ideas and best practices for cost savings and process improvements (Richman et al., 2008). NH Heart Hospital, meanwhile, has developed an efficient turnover of operating rooms and cardiac catheterization facilities, allowing for much higher volumes of services with an only modest investment in capital equipment.

Life Spring Hospital: Hospital adopted systems re-engineering to achieve profitability within two years of inception and it provides affordable maternity care. One of the best practices adopted by them is the scale downing of beds. Life Spring orders smaller and simpler beds for its maternity wards but does not skimp on the delivery Tables for operating rooms in its 12 hospitals in Hyderabad.

Vaatsalya Hospital: Vaatsalya Hospital’s frugal innovation includes lower resolution ultrasounds and lower parameter patient monitors in its 18 branches.

Apollo Hospital: To reduce waste, Apollo Hospitals has asked suppliers to shorten the length of sutures in each packet—and also to lower the price accordingly, after it found that its doctors were routinely discarding one-third of each suture after procedures.

CARE Hospital: CARE has developed low cost and high-quality stents that perform equally well as compared to the imports that cost ten times as much. It has set up a subsidiary to manufacture the stents, along with catheters and other devices. Moreover, it develops physician leadership at each facility with a “servant leadership” model that empowers physician-led initiatives (Richman et., al., 2008). Also, they have adopted “multi-tariff”, the practice of price discrimination (differential pricing) to target multiple segments of the ever-changing Indian population (Richman et., al., 2008). CARE reengineered their service delivery model to maximize the use of capital equipment. For instance, CARE maximized the usage of radiology equipment by continuous usage. They use the equipment for outpatient studies during the day and inpatient radiology studies overnight avoiding periods of downtime for capital equipment.

Fortis Hospital: Physicians and senior administrators at Fortis view themselves as a collaborative leadership partnership. This model enables “owner-operator”

innovations that are agile and patient-focused. Moreover, Fortis has managers with experience in the burgeoning hotel industry. The application of management routines and capabilities from the hotel industry helps Fortis manage patient care in the context of customers' experiences and patients' expectations.

Government Initiatives: E-RaktKosh, Swastha Bharat mobile application, and ANMOL are few initiatives taken by the Government of India to reach to remote areas. The Swastha Bharat mobile application was introduced on World health day 2016 for information on diseases, symptoms, treatment, health alerts, and tips. ANMOL- is an ANM online tablet application for health workers & e-RaktKosh is a blood-bank management information system. Moreover, individual states are adopting technology to support health-insurance schemes.

4.4 Implications for Healthcare Management

It can be noted that the innovative models adopted by the Indian healthcare institutions provide high expectations on the idea of innovation as the solution to the high cost of healthcare services. Moreover, private hospitals like Aravind Eyecare, Narayana Health, and Vaatsalya Hospital have proved that their low-cost models achieve better performance than the existing standards, which created value for both investors and consumers. It can also be noted that these private hospitals have successfully adopted all the possible robust, innovative designs like hub-and-spoke design, task shifting, and frugal innovations. The careful analysis of their success stories indicates that the adoption of better management practices primarily in the areas of operations management, people management, and target management helped them to achieve success in providing low-cost, high-quality healthcare to a wide range of people. Table 1 represents the management practices in all the three areas: operations management, human resource management, and target management.

The physician leadership and servant leadership practices, the "multi-tariff" practices, and the practice of effective utilization of machines by robust job scheduling helped CARE hospital to achieve success. Some notable practices which Apollo adopted are 'collaborative leadership practices,' appointing managers who have got experience in managing the hotel industry to improve patient satisfaction, TeleHealth, and TeleMedicine for specialized consultations. All these practices are the indications of creative thinking and it is clear that by creating innovation in technology, strategies, methods, and policies we can take on local and global healthcare challenges.

Similarly, Aravind Eyecare has followed unique human resource practices like in-house training operations to develop ophthalmologists, paramedics, eye care managers, and support service personnel. Therefore, the study indicates that the adoption of innovative management practices would improve quality and patient satisfaction. This, in turn, would generate demand which could be met by providing a low-cost service through optimal use of the limited available resources.

5. Conclusion

Affordability is the key to accessibility. The study shows that in the economic reality of a developing country, innovative ideas, cheaper drugs, optimized processes, and low-priced healthcare infrastructure models can work wonders. However, inexpensiveness is not simple to put into effect; it requires creative, out-of-the-box

thinking like frugal innovation. Such innovative ideas and practices can help a complex and resource-constrained country like India to address challenges in healthcare delivery. For this, the nation's innovation capability needs to be enhanced through the right kind of fiscal incentives, policy support, financing mechanisms, human capital, and best-in-class infrastructure. Moreover, daunting challenges in healthcare delivery throw up unlimited opportunities to innovate and creative solutions. India has the chance to leapfrog lots of the healthcare problems that developed nations are grappling with by the implementation of innovative low-cost models.

Table 1 *Best Practices Adopted by the Hospitals*

Operations Management Practices	Human Resource Management practices	Target Management Practices
Adoption of better maintenance and repair practices	Structured In-house training	Differential pricing
Reuse of medical devices sold as single-use products	Motivates the doctors by including the doctors in decision making	Owner-operator innovations
The systematic arrangement of workflow	Training and empowering women from villages who have only primary educations as mid-level ophthalmic	Collaborative leadership partnership
Standardized operations	continuous education to widen the skills	infuse cost awareness
Highly efficient assembly line method	Physician leadership	Unique service-oriented model.
Technology-transfer	Servant leadership	
Telemedicine centers	Innovative recruitment process	
“pay-per-use” of costly equipment	Recruiting personnel who have experience in the hotel industry to boost patient satisfaction.	
Systems re-engineering		
Scale downning of beds		
Usage of lower resolution ultrasounds and lower parameter patient monitors		
Shortening the length of sutures in each packet		
Scheduling the timing of machines for optimized usage		

Source: Compiled from the Literature

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