A Study on Innovative Healthcare practices in India- The Hidden Opportunities in the Indian Healthcare Industry

Sinimole K. R
N L Dalmia Institute of Management Studies and Research
(skp_radhas@yahoo.com)

The Healthcare sector is growing rapidly and has become 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 policy to help the innovations that will focus on an Indian model for 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

1. Introduction

The Healthcare sector is growing rapidly and has become 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 strengthening coverage and services. The expenditure by the public as well as private players are also increasing, and the sector is expected to grasp$372 billion by 2022 (National Investment Promotion and Facilitation Agency, 2019).

However, despite some 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 in the number of doctors, India meets the global average. However, 74 % of its doctors cater to a third of the urban population, and is short of doctors at village community health centers (CHCs) (KPMG report, 2017).

There are, however, potential catalysts to improve the quality of healthcare in India. The incentives are in terms of innovative models and government policies. 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). Because 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. Moreover, the National Innovation Council encourages a culture of innovation in India and helps the changes that will focus on an Indian model for inclusive growth. Subsequently, value-based war is not a hallucination but a reality in India. 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.

2. 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.

3. Innovative Models Adopted by the Indian Healthcare Institutions

Healthcare institutions function in an industry characterized by continuous change. The change is due to the convergence of numerous influences from both within and outside of their 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). To read on their dual commitments to high quality and ultralow cost, the Indian healthcare institutions 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.

3.1 A Hub-and-Spoke Design

The hub-and-spoke model provides a network comprising of the main campus and one or more satellite campuses, and it

offers a high potential for serving patients well (Ahlquist et al. 2012; Porter & Lee, 2013; Govindarajan & Ramamurti, 2013).The Indian healthcare institutions adopted the method of airlines to reach out to remote areas, and they created hubs in major metro areas and designed small clinics in rural areas that directed patients to the main hospital. The hub and spoke model is a highly synchronized network which lessens 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 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), it is much more efficient than organizational designs that reproduce operations across multiple sites. The success stories of Indian hospitals like Vaatsalya Healthcare, Aravind Eye Care System, Narayana Health, HCG - Healthcare Global Enterprises Ltd etc. prove that the 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).

3.2 Task-Shifting

Task-shifting is the process of delegating appropriate tasks to less specialized health workers with shorter training and fewer qualifications. It helps to improve health care coverage by making more 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. These 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.

3.2.1   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 newborns 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, and it 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 opinion. 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.

3.2.2. Government Models

India's community based public healthcare includes three crucial programmes: Anganwadi worker, ASHA worker, and the auxiliary 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 attending 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 newborns, contraception counseling, cervical cancer detection, and primary care and resuscitation of the newborn (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 are the women volunteers who serve as health activists, community mobilizers, and essential care providers (National Health Mission Guidelines, 2013). ASHA's 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, and 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 a less expensive option to train while not 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).

3.2.3 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 increase 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 and also to drive down 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, and also it reduces the cost considerably (Richman et al., 2008).

3.3 Frugal Innovation
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 & Juntiwasarakij, 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 & Mark ides, 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 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 2,000surgeries annually in comparison to the200 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 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 focused on process innovation and used 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) gets them satellite connectivity, which connects over 100 telemedicine centers across the country and receives 250 ECGs everyday 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.

LifeSpring 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 asked suppliers to shorten the length of sutures in each packet—and 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 as well as 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 continuously using it. 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-Raqtkosh, Swastha Bharat mobile application, and ANMOL are few initiatives taken by the Government of India to reach out 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. Discussion

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 Eye care, Narayana Health, and Vaatsalya Hospital have proved that their low-cost models achieve better performance than the existing

standards, and it 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. The 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 Eye care 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 a lot of the healthcare problems that developed nations are grappling with, through 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
	Training and empowering women from villages who have only primary educations as mid-level ophthalmic personnel	
	continuous education to widen the skills	
The systematic arrangement of workflow	Physician leadership	Collaborative leadership partnership
Standardized operations	Servant leadership	infuse cost awareness
Highly efficient assembly line method	Innovative recruitment process	unique service-oriented model.
Technology-transfer	Recruiting personnel who have experience in the hotel industry to boost patient satisfaction.	
Telemedicine centers		
"pay-per-use" of costly equipment		
Systems re-engineering		
Scale downing 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

6. References

1. Ahlquist G, Saxena S, B, Belokrinitsky I, Kapur A. (2012), "Charting a clear course in rough seas: a new view on hospital and health systems strategy," New York: Strategy & Aravind Hospital (2016), "Aravind Eye Care System: Activity Report 2015-16". Tamil Nadu India.
2. Anderson, J., & Markides, C. (2007), "Strategic innovation at the base of the pyramid", MIT Sloan Management Review, 49(1), 83-100.
3. Bang A., Bang R., (2010), "Research with the People," Forbes India. http://www.forbesindia.com/article/ideas-to-change-the-world/dr-abhay-bang-research-with-the-people/13742/1
4. Balsari S., Phadke, M., Simon, G., Goyal, R., Mulholland, I (2017), "Task Shifting in Healthcare: Reframing the AYUSH Debate", Harvard University South Asia Institute, USA.
5. Bang A., Bang R., (2005), "Background of the field trial of Home-based Neonatal Care in Gadchiroli, India," J Perinatology, 25, 1-10.
6. Bang A., Bang R., and Reddy, H., (2005), "Home-based Neonatal Care: Summary and Applications of the field trial in Rural Gadchiroli," Journal of Perinatology, 25, 108-122.
7. Bound, K., & Thornton, I. W. (2012), "Our Frugal Future Lessons from India's Innovation System", United Kingdom: NESTA.
8. Chowdhary N., Anand A., Dimidjian, S., Shinde S., Weobong B., Balaji M., et. al., (2016), "The Healthy Activity Program lay counselor delivered treatment for severe depression in India: Systematic development and randomized evaluation", Br. J. Psychiatry, 208, (4), 381-388.
9. Christensen, C. M., Bohmer, R., & Kenagy, J. (2000), "Will disruptive innovations cure health care?", Harvard Business Review, 78(5), 102-113.
10. Desai, K.T., Nayak, S.N., Patel P, B., Modi, B.P., Gharat W., Bansal, R., (2014), " Follow –up Assessment of Undernourished Children Under integrated Child Development Services Scheme in Tapi District, India," Int. J. Prev.Med., 5(6), 758-66.
11. Devarakonda S. (2016), "Hub and spoke model: making rural healthcare in India affordable, available and accessible," Rural Remote Health, 16(1):1–8.
12. Dunn L. (2017), "What the U.S. can learn from healthcare delivery overseas: Q&A with Harvard Business School's Regina E. Herzlinger. Becker's Hospital Review". Available online: http://www.beckershospitalreview.com/hospital-management-administration/what-the-us-can-learn-from-healthcare-delivery-overseas-qaa-with-harvardbusiness-schools-regina-e-herzlinger.html.
13. Govindarajan V, Ramamurti R., (2013), "Delivering world-class health care, affordably." Harv Bus Rev. 91(11):117–22.
14. http://www.beckershospitalreview.com/hospitaltransactions-and-valuation/4-emerging-models-provide-strategy-roadmapfor-future-transactions.html.
15. Hart, S. L., & Christensen, C. M. (2002), "The great leap - Driving innovation from the base of the pyramid", MIT Sloan Management Review, 44(1), 51-56.
16. Kanter, R. M. (1999), "From spare change to real change - The social sector as beta site for business innovation", Harvard Business Review, 77(3), 122-140.
17. KPMG. (2012), "Value works - Successful habits for improving workforce motivation and Productivity", KPMG International.
18. Jamison. D. T. and Martin Sandbu, (2001), "WHO Rankings of Health System Performance," Science, 293: 5535, 1595-1596.
19. Lehmann, U., and Sanders, D. (2007), "Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs, and impact on health outcomes of using community health workers", World Health Organization, Geneva, Switzerland.
20. Lim, C., Han, S., & Ito, H. (2013), "Capability building through innovation for unserved lower end mega markets", Technovation, 33(12), 391-404.
21. Mavalankar D., Vora K., S, (2008), "The changing role of Auxillary Nurse Midwife (ANM) in India: Implications of Maternal and Child Health (MCH)." Indian Institute of Management Ahmedabad, India.
22. Natchiar, G., (2001), Clinical Strategies for High Quality, Large Volume, Sustainable Cataract Surgery Programmes. Aravind Eye Hospitals, India.
23. Natchiar, G., Thulasiraj, R.D., & Sundaram, R. M. (2008). Cataract surgery at Aravind Eye Hospitals: 1988-2008. Community Eye Health, 21 (67), 40
24. National Health Mission Guidelines: accredited Social Health Activist, Haryana, India.
25. National Health Mission, (2010), "ASHA: Which way forward? Executive Summary Evaluation of ASHA,", Delhi, India.
26. National Health Mission, (2013), "Update on the ASHA Program," New Delhi India.
27. National Health Mission, (2016), "National Deworming Day 2017: ASHA Information Brochure New Delhi India.
28. National Rural Health Mission, 2012, Indian Public Health Standards. Anganwadi: http://aanganwadi.org/
29. Patel V. (2015), "SUNDER mental health for all by all," BJPSYCH International, 12 (1), 21-23.
30. Petrick, I. J., & Juntiwasarakij, S. (2011), "The Rise of The Rest: Hotbeds of Innovation in Emerging Markets", Research Technology Management, 54(4), 24-29.

31. Prahalad, C. K., & Mashelkar, R. A. (2010), "Innovation's holy grail", Harvard Business Review, 88(7-8), 132-141.
32. Porter M, Lee T. (2013), "The strategy that will fix health care," Harv Bus Rev., 91(10):50–70.
33. Rangan V., K., and Thulasiraj, R., D., (2007), "Making Sight Affordable Innovations Case Narrative: The Aravind Eye Care System," Innovations: Technology, Governance Globalization 2(4), 35-52
34. Rani, G., P. (2011), "A Case Study on Aravind Eye Care Systems", Amrita School of Business, Coimbatore
35. Richman, B., D. Udayakumar, K., Mitchell W., et al., (2008), "Lessons from India in Organizational Innovation: A Tale of Two Heart Hospitals," Health Affairs, 27(5):1260–70.
36. Roney K. (2012), "4 emerging models provide strategy roadmap for future transactions", Becker's Hospital Review [Internet].
37. Saprii L., Richards E. Kokho, P., Theobald, S., (2015), "Community health workers in rural India: analyzing the opportunities and challenges Accredited Social Health Activists (ASHAs) face in realizing their multiple roles. Hum Resource Health, 13:95
38. Scott, D., (2013), "The $20 Eye Surgery That Could Save the World", https://www.governing.com/topics/health-human-services/gov-eye-surgery-that-could-save-world.html
39. Shi L, Singh D., A., (2017), "Essentials of the US health care system," 4th ed. Burlington: Jones and Bartlett;
40. Svensson, G. (2001). 'Glocalization' of business activities: a 'glocal strategy' approach", Management Decision, 39(1), 6-18.
41. Vickers, T., & Rosen, E. (2011), "Driving Down the Cost of High-Quality Care: Lessons from the Aravind Eye Care System", In McKinsey & Company (Ed.), Health International
42. Witmer A., Seifer S.D., Finocchio L., Leslie J. ONell E.H., (1995), "Community Health Workers; integral members of the health care workforce, Am. J. Public Health, 85, 1055-8.
43. World Bank Data- https://data.worldbank.org/indicator/SP.DYN.IMRT.IN
44. World Health Organization (WHO), (2008), "Task Shifting: Global Recommendations and Guidelines).
45. World Health Organization, WHO. (2010), "Health Systems Financing World Health Report", World Health Organization. Geneva
46. World Health Organization, WHO. (2012), "Emerging Economies Drive Frugal Innovation Bulletin", World Health Organization, 91, 6-7