

Innovative Partnerships Enhancing Care Delivery in India

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Exec Summary

The current healthcare climate in India is a toxic mix of non-standardized quality, high cost, and limited access for communities at the margin. The public and private health system in India faces the challenge of responding to the needs of the most disadvantaged members of Indian society. The public health system, though infrastructurally expansive, suffers from a lack in human capital coupled with inconsistent and below average quality. The private health system, in contrast, is concentrated in urban geographies and is over nine times more expensive. Currently, both public and private care do not have the resources or infrastructure to bridge the gaps in quality and cost of healthcare by themselves.

This paper starts by illustrating the current state of health care in India, specifically focusing on the pitfalls of care in terms of access and quality. Through a breakdown of innovation in partnerships and a partnership analysis of two successful enterprises, the author highlights how innovative partnerships, through value- increasing and cost lowering mechanisms, utilize existing solutions to bridge the gaps in health mentioned above. The paper concludes with strategic considerations when pursuing partnerships, focusing on CareNX a health-related social enterprise based in Mumbai India.

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Introduction

Despite increased infrastructure and increases in government health spending, inequalities in access to healthcare for communities at the margin are steadily increasing. The current healthcare system consists of public/government health institutions and private health institutions. The public health system in both rural and urban India suffers from poor management, subpar quality, and minimal funding. In contrast, private hospitals provide quality services but are characterized by high out of pocket expenditures and minimal access to low-income patients.

Public and private hospitals cannot bridge the gaps in health care by themselves but through innovative partnerships with collaboration, coordination, cooperation, and network partners, enterprises have the opportunity to utilize existing solutions to create low-cost, quality health interventions. This paper aims to show that through careful partnership design, the limitations of the dominant forms of health care institutions in India can be overcome, and quality, access, and efficiency can all be enhanced.

Starting with an overview of the current healthcare system in India and its pitfalls, this paper shows how innovative partnerships can address the supply and demand constraints that currently characterize Indian health care. Three examples of companies (CareNX, Aravind Eye Care, Narayana Hrudayalaya Hospital) with innovative partnerships are analyzed, highlighting the cost minimizing and value increasing mechanisms that are possible for communities at the margin through innovative partnerships.

The paper concludes with the practical implications of entering into sustainable partnerships with public and private institutions for CareNX, a health-related social enterprise that has mobilized maternal health care in India. Three strategies are provided, based on the enterprise life cycle, for CareNX to approach a Public-Private-Partnership, including partnering with an NGO, entering a Tri-Party-Partnership, and partnering with the government, based on interviews with hospital admin, program managers, community health workers, and the CareNX team.

The Fractured Nature of Indian Health Care

This section illustrates the current nature of public and private health care in India, focusing on the pitfalls of each type of care. Public and private care is analyzed using the World Health Organization's framework for improving health care quality in low-resource settings.

WHO Health Care Evaluation Method¹

When analyzing health care systems in low resource settings it is important to consider quality improvement and strengthening infrastructure and access. The World Health Organization published a framework for maximizing the potential of quality improvements that focuses on five main elements: systems thinking, stakeholders' participation, accountability, evidence-based interventions, and innovative evaluations.

Systems thinking highlights the dynamic adaptive systems that characterize health care delivery at institutions. It focuses on the inter-relationships between patient, clinical, and non-clinical workers in the health institutions, the different levels of the health systems ranging from primary to tertiary hospitals, and the required human and material resources, management, and infrastructure required to deliver care.

Stakeholder participation is the largest determinant of access to health care in low-resource settings. Health systems that are grounded in bottom-up approaches that involve health-care professionals, patients, and community members increase community buy-in and therefore further improves the access and reach of the health system. Active involvement from each stakeholder allows care to be tailored to sociocultural beliefs and builds accountability within the system.

Health systems are only sustainable if there is accountability from the managers of the health system to the individuals and the local community that the health system is serving. Accountability stems from accurate and timely data that is used to track quality improvements and quantifies the impact.

Accountability is rooted in an evidence-based approach. Health systems that maintain accountability through data harmonization coupled with a commitment to maintaining high standards of scientific and academic rigor allows for efficient and quality care.

Lastly, innovative evaluation methods are integral in health systems in a low resource setting for understanding and advancing quality improvements. Innovative evaluation methods are especially important for understanding resource constraints in these settings as well as recognizing and addressing implementation problems.

Public Institutions

The public health system in both rural and urban India suffers from poor management subpar quality, and minimal funding. Though there is substantial government health infrastructure due to the Indian constitutional right to health care, the lack of funding has deteriorated the quality of health care in most of the public hospitals.

Currently, the public health system is split between rural and urban geographies. In rural villages, there are sub-centers that exist in every village. These centers, in theory, are less than a 5 km walk for everyone in the village. The sub-centers are operated by Auxillary Nurse Midwives (ANMs) who are trained at the clinical and reporting level. These nurses are capable of

¹ Nambiar, Bejoy, et al. "Improving Health-Care Quality in Resource-Poor Settings." *Bulletin of the World Health Organization*, vol. 95, no. 1, 2016, pp. 76–78., doi:10.2471/blt.16.170803

conducting delivery, providing antenatal and postnatal care, and prescribing basic medications. Accredited Social Health Activists(ASHAs) work under ANMs in the individual neighborhoods and provide doorstep care to those who cannot make it to the subcenters. The ASHAs conduct health camps and focused care days for those in the village and bring community members to the subcenter for more extensive testing.

If the patient at the subcenter requires more tests or more advanced care, the ANMs refer the patient to a primary health center(PHC). The primary health center is in charge of a gram panchayat(a group of 5 villages). PHCs have a medical officer and a senior public health nurse on call at all times. Care at PHCs is more clinical but also further away from the majority of the rural population. For a higher level of care, medical officers refer patients to rural hospitals, which are responsible for a block(a group of gram panchayats) and to district hospitals, which are responsible for a group of blocks. District hospitals are full functioning hospitals that often have doctors that are specialized and highly trained.

In urban areas, as the population is highly concentrated over a small geography, there are not as many levels of care as rural areas. The first level of care is health posts. Health posts operate at the village level and have a medical officer and ANMs. Health posts provide basic care like height and weight measurements as well as the basic distribution of medications. The next level of care in urban areas are maternity wards. Maternity wards are in charge of 3-4 health posts and have facilities for more advanced care like deliveries and non-invasive surgeries. The last level of care is tertiary hospitals, which are in charge of 2-3 maternity wards. Tertiary hospitals are similar to district hospitals as they aim to provide comprehensive care from family doctors to specialized doctors that perform surgery.

Private Institutions

The private health care system is not as uniform as the public system as care is often tailored to the community that the private institution is working in. Private health care operates from a top-down approach where patients are registered at bigger district hospitals which are linked to clinics at the block level. Depending on how large the private entity is, there might only be a single clinic or an entire health system that is organized by the private institution.

Pitfalls of Public and Private Institutions

When discussing the pitfalls in public and private institutions when they operate alone, I will utilize the World Health Organization framework for health evaluation in low resource settings outlined above.

Table 1. Public and Private Pitfalls based on WHO framework²³⁴⁵

Evaluation Guidelines	Public Health Care	Private Health Care
Systems Thinking <ol style="list-style-type: none"> 1. Micro-Clinical Team 2. Meso-Health Facilities 3. Macro-Healthcare System 	<ol style="list-style-type: none"> 1. <u>Clinical Team</u>: Number of medical officers are small, the clinical team is mostly made up of ANMs and ASHAs. <ol style="list-style-type: none"> a. Accounts for 19% of doctors in India-deficient manpower b. 30% of patients have paid bribes to see government doctors. 2. <u>Health Facilities</u>: Strong Infrastructure but bad quality <ol style="list-style-type: none"> a. 71% of hospital beds b. Pay bribes to get bedding and food while in hospital c. 26% of subcenters without water and electricity 3. <u>Healthcare System</u>: Majority of patients not coming to public health institutions. <ol style="list-style-type: none"> a. Accounts for 20% of all outpatient care b. Increasing patient burden on tertiary centers-$\frac{2}{3}$ of patients are self-referred even though all patients who come to the tertiary hospital should be doctor referred c. Annual average cost of Rs928/- 	<ol style="list-style-type: none"> 1. <u>Clinical Team</u>: Majority of doctors in India, the clinical team is private CHWs or ASHAs that receive additional training and pay. <ol style="list-style-type: none"> a. 81% of doctors b. 25% of nurses c. Doctors have higher wage 2. <u>Health Facilities</u>: High-quality facilities that are centered in urban centers <ol style="list-style-type: none"> a. Accounts for 58% of all hospital buildings and 29% of hospital beds b. 80 percent of private hospitals are in urban geographies compared to 20 percent in rural geographies 3. <u>Healthcare System</u>: Majority of patients coming to private facilities despite high costs <ol style="list-style-type: none"> a. Accounts for 60% of inpatient care and 80% of outpatient care b. Annual average cost of Rs. 11,130/-
Stakeholder Participation <ol style="list-style-type: none"> 1. Health System Readiness <ol style="list-style-type: none"> a. Health Workforce Capacity b. Capacity Building 2. Community Engagement <ol style="list-style-type: none"> a. Access b. Affordability 	<ol style="list-style-type: none"> 1. <u>Health System Readiness</u> <ol style="list-style-type: none"> a. Due to low retention and number of doctors, no engagement across the supply chain of health care delivery b. The unwillingness of doctors to work in rural areas and high turnover leads to no relationship between Medical Officers and ANMs and ASHAs c. ASHAs work collaboratively within the communities and ANMs but have little to no contact with medical officers d. Lack of collaboration leads to breaks in care and contributes to overall inefficiency 2. <u>Community Engagement</u> 	<ol style="list-style-type: none"> 1. <u>Health System Readiness</u> <ol style="list-style-type: none"> a. Trained and specialized doctors that are expected to charge large fees due to their increased wage b. Services too expensive to collaborate with far-reaching subcenters and PHCs in rural areas c. The unwillingness of doctors to work in low resource settings due to lower wages d. Large (foreign) corporations often control private hospitals which creates standards of care far removed from the standard for most Indians 2. <u>Community Engagement</u>

² Nambiar et al, "Improving health-care quality in resource-poor settings" World Health Organization

³ Vikas Bajpai, "The Challenges Confronting Public Hospitals in India, Their Origins, and Possible Solutions,"

⁴ World Health Organization. 2017. "Out-of-pocket health expenditure (% of total expenditure on health", World Health Organization Global Health Expenditure database, 2017.

⁵ Sengupta, A., & Nundy, S. (2005). The private health sector in India. *BMJ (Clinical research ed.)*, 331(7526), 1157-8.

	<ul style="list-style-type: none"> a. Quality of care described above discourages the community from utilizing subcenters and primary health centers b. Affordable care but unreliable quality leads to a lack of utilization c. Patients not empowered to seek care due to a lack of efficiency and quality. 	<ul style="list-style-type: none"> a. Only 1/3 of the population has access to private hospitals b. The community not involved in any care aspects unless private hospitals have an outreach arm that is working in rural villages. c. Lack of access creates care that is not tailored to low-income patients
Accountability <ul style="list-style-type: none"> 1. Bottom-up generation of data (CHW collected) 2. Visual Presentation of data to decision makers 3. Iterative Feedback to members along the supply chain 	<ul style="list-style-type: none"> 1. <u>Bottom-up generation of data</u> <ul style="list-style-type: none"> a. Manual reporting of data on large notebooks b. Introduced RCHD online portal for tracking data -Not used uniformly and technical problems 2. <u>Visual Presentation of data to decision makers</u> <ul style="list-style-type: none"> a. CHWs report that no one collects the data they collect b. No current infrastructure for creating visual representations of data 3. <u>Iterative Feedback to members along the supply chain</u> <ul style="list-style-type: none"> a. No in-person interview with CHWs, ANMs, and ASHAs to get qualitative data on how the health system needs to improve for efficiency b. CHWs, ANMs, and ASHAs have incentives to falsely report to get raises and monetary bonuses 	<ul style="list-style-type: none"> 1. <u>Bottom-up generation of data</u> <ul style="list-style-type: none"> a. Private hospitals have resources to collect qualitative and quantitative data b. High cost/ low access leads to data inaccurately representing population 2. <u>Visual Presentation of data to decision makers</u> <ul style="list-style-type: none"> a. Decisions are driven by data <ul style="list-style-type: none"> i. Data only represents high-income patients and therefore decisions not made for low-income patients 3. <u>Iterative Feedback to members along the supply chain</u> <ul style="list-style-type: none"> a. Though feedback is given, it does not accurately represent low-income patients b. Rural population do not have regular access to private hospitals and therefore receive no feedback and are not represented.
Evidence-Based <ul style="list-style-type: none"> 1. Routine data collection(project monitoring, improvement, and evaluation data) 2. Investment in data quality and data management 3. Easily Accessible Improvement Metrics 	<ul style="list-style-type: none"> 1. <u>Routine Data Collection and Evaluation</u> <ul style="list-style-type: none"> a. Manuel Reporting b. RCHD online portal (not effective) 2. <u>Data Quality and Data Management</u> <ul style="list-style-type: none"> a. Errors due to manual reporting b. Some manual reports have been lost leading to holes in the information 3. <u>Impact Metrics</u> <ul style="list-style-type: none"> a. Impact metrics in place but not utilized b. Since govt. hospitals are not utilized, the data is limited and skewed. c. Not representative of the population 	<ul style="list-style-type: none"> 1. <u>Routine Data Collection and Evaluation</u> <ul style="list-style-type: none"> a. Strong data collection methods but not representative of the current state in low-income areas 2. <u>Data Quality and Data Management</u> <ul style="list-style-type: none"> a. Electronic records: easy info sharing b. Data quality for low-income areas is questionable as private hospitals are the last resort(high mortality rates) 3. <u>Impact Metrics</u> <ul style="list-style-type: none"> a. Impact metrics in place but data is skewed as access is severely limited
Evaluations <ul style="list-style-type: none"> 1. Innovative evaluation model <ul style="list-style-type: none"> a. Data and Statistical Analysis 	<ul style="list-style-type: none"> 1. <u>Evaluation</u> <ul style="list-style-type: none"> a. Though an evaluation system is built into the data collection, the lack of quality highlights breaks in the evaluation system. b. No follow through with data leading to no big changes in the health system. 	<ul style="list-style-type: none"> 1. <u>Evaluation</u> <ul style="list-style-type: none"> a. Care is highly personalized and specialized due to constant evaluation and analysis b. Infrastructure exists for evaluation but the infrastructure worthless if access does not increase.

Partnerships Create Value in Low Resource Settings

This chapter highlights the possibilities that innovative partnerships have in reducing cost and enhancing access and quality of health care in India.

The Promise of Partnerships

Partnerships have the potential to minimize supply and demand constraints in cost-efficient ways. Goal number 17 of the 2016 SDG's highlights the importance of revitalizing the global partnership for sustainable development. Any successful sustainable development agenda requires partnerships between the public/government sector, the private sectors, and civil society⁶. It is within innovative collaborations between existing public and private institutions that top-down goals and bottom-up community aspirations are met. Sustainable partnerships between diverse members of the health care sector improve equity, efficiency, accountability, quality, and accessibility.

There are two main factors to consider when maximizing the supply-demand axis of health care in India: access to and an opportunity for health care and use of health care. Access to health care includes availability, accessibility, affordability, and acceptability of health care institutions and interventions. Use of health care depends on socioeconomic, cultural, and environmental factors that may either enhance or obstruct health care utilization and outcomes.

Supply and Demand Fails in Public and Private Hospitals

The main pitfalls of private care center around the inability to meet the demand determinants of health care. As private care often does not cater to low socioeconomic status or take into account the demographic and contextual factors that push communities at the margin to spend a majority of their income on health care, it fails to provide efficient and quality care to the majority of India's population. According to the latest census, 70 percent of India's population lives in rural areas. The private sector is unable to meet this demand given that 80 percent of private hospitals are in urban areas. Without adequate infrastructure in place to meet the demand of healthcare in India, the private sector care favors those who have the financial resources to travel and seek out care. Those who are in need of the care often have to borrow or sell assets or drain major savings to meet the financial burden of higher quality, private care.

In contrast, the public care sector aims to meet the demand for health care but fails to meet the majority of the supply determinants of an efficient health care system. Though the infrastructure exists for efficient care, the low quality of care leads to the underutilization of primary health centers and subcenters. The scope and strength of the care are low due to the lack of manpower in delivering care. With a high proportion of doctors in the private care sector, the lack of human capital leads to limited access to care, especially in rural areas where medical officers rarely prefer to stay. The structure, organization, and policy framework of care is outdated and therefore there is a lack of health system responsiveness. Though public care is heavily subsidized for those who cannot afford it, the subpar quality due to failures in operational measures has led patients in low-income communities to skip public care and pay hefty prices for private care.

The healthcare landscape in India is inefficient due to failures in the allocation of resources that has led to significant breaks in care. Partnerships that maximize the supply and

⁶ Carlson, Eric Daniel, and James L. Koch. Building a Successful Social Venture: a Guide for Social Entrepreneurs. Berrett-Koehler Publishers, Inc., 2018.

demand determinants from each form of care have the opportunity to enhance access and quality while minimizing costs.

Innovative Partnerships: Capital, Resource, and Technical Efficiency⁷

Partnerships with distinct value exchanged leads to innovative solutions to increase capital, resource, and technical efficiency. Partnerships with government hospitals provide a platform for the infrastructural capacity generation that is needed to bring access to healthcare in rural and remote regions in India. The government clinics already exist at the sub-center and primary level but are severely underutilized. Partnerships that help use and distribute capital efficiently is the first step towards lowering the cost of health care.

Public-Private partnerships enhance the output of the health system by reallocating resources so that the marginal cost of producing health care is less than the marginal benefit. When Public and Private institutions operate alone, the deadweight loss because of misallocation of resources is large. For example, the opportunity cost for public institutions to completely revamp the quality of their care is much larger than their benefit and therefore quality has deteriorated in public institutions. The opportunity cost for private institutions to lower the price of their care or expand to rural and low-income areas is also much larger than their benefit and therefore there is a high concentration of private institutions in urban centers. Partnerships that help re-allocate these resources make the delivery of care more economically efficient. Creating partnerships based on marginal benefit and marginal cost analyses leads to the costs of inputs being minimized for a given level of output. This cost decrease is not related to a decrease in quality or quantity but more efficient use of capital and resources. Along with better utilization of public and private institutions, partnerships with social enterprises optimize the rate of technology innovation and adoption. Increased innovation that is supported by government hospitals and private institutions help bring care to the doorstep for little to no costs.

Value Creation through Innovative Partnerships

With any public health intervention or care delivery model, the success of the intervention centers on two change mechanisms: value increasing mechanisms and cost lowering mechanisms. Value increasing mechanisms are mechanisms that increase the value of products or services with no increase in cost to beneficiaries. Innovative partnerships create value primarily through the reallocation of resources and services. By bringing together the most effective aspects of organizations, partnerships add value to existing assets through new processes and eliminate underutilization of infrastructure and human capital. In conjunction with value creating mechanisms, cost mechanism lower cost without decreasing benefits or value. Examples of cost-lowering mechanisms through innovative partnerships include utilizing doctors in the private sector to train government CHWs in quality care delivery which allows for the substitution of lower cost labor or utilizing platform technologies across sectors to improve information sharing and lowering capital costs. Innovative partnerships that capitalize on both value-creating and cost lowering mechanisms have the potential to focus on breadth and depth scaling due to the diversity of each partner and effectively can address the structural parameters and affordability constraints that exist when engaging with communities at the margin.

Social Entrepreneurship Role in Partnerships

C.K Prahalad, in his book *The Fortune at the Base of the Pyramid* highlights that the “unmet need at the Base of the Pyramid is a profit opportunity for companies that can overcome two major challenges:(1) how to provide affordable, easy-to-use solutions for the significant

⁷ Carlson, Eric Daniel, and James L. Koch. Building a Successful Social Venture: a Guide for Social Entrepreneurs. Berrett-Koehler Publishers, Inc., 2018.

problems of the poor, and (2) how to provide ease of access to such solutions.⁸ Social Enterprises are in a unique position to coordinate between both private and public health institutions to capitalize on the quality of care in private institutions and the current infrastructure that exists in public institutions. Social enterprises can serve as a catalyst for system solutions due to their field knowledge of community barriers to care and to facilitate regional networks between local organizations and institutions. By bringing together the most efficient parts of each institution, social enterprises are able to provide a cost-effective solution to the challenges of demand creation and supply enhancement.

Social enterprises breakdown the challenge of demand creation through partnerships with NGOs and local organizations that have been working within the communities for many years. Local organizations have already raised awareness, built trust, and in many cases have already started to breakdown culturally ingrained barriers to care in the community. By partnering with these organizations, social enterprises have access to patients who are more likely to trust the new health care system and be receptive to change. Social Enterprise partnerships with government hospitals also help with patient financing, especially regarding government subsidies that stimulate demand and creates value for public institutions.

Social enterprises also have the ability to tackle supply enhancement challenges through partnerships with private hospitals and NGOs. Especially when working with technology-based social enterprises, the largest supply challenges surround the lack of access to reliable energy and after-sales service capacities. Private hospitals often have reliable sources of energy and access to resources but the high cost of care leads to decreased access for low-income individuals. Through partnerships with private hospitals, social enterprises can provide products that are high quality but lower cost so that the price of care decreases. Partnering with private hospitals provides the magnitude and quality of human resources needed to provide care. The focus on human infrastructure development and generation regarding the doctor and nurse population in private hospitals leads to a concentrated pool of highly trained medical staff. Utilizing this pool, through partnerships with private institutions to help deliver care, increases quality and efficiency drastically.

Social Enterprise partnerships with both public and private institutions allow for utilization of a healthcare framework that has proven to work in communities, with low-cost inputs and high-quality human resources.

Types of Partners⁹

In order for a social enterprise to efficiently function, there are a number of partners that create, deliver, and capture value. Each of these partners can be characterized by four main groups: network, coordination, cooperation, and collaboration. The main function of network partners is an information exchange. Network partners often help with customer acquisition but are not involved in the implementation of care. Coordination partners are partners who have similar processes but serve different beneficiaries, or interdependent processes that serve the same beneficiaries. Most coordination partners have been working with the communities for many years and their partnership is used to expand reach. Coordination partners are easy to work with as they require no training and their implementation strategies have proven to work in the community. For cooperation partners, one partner “outsources” and pays another partner for

⁸ C.K Prahalad *The Fortune at the Base of the Pyramid*

⁹ Carlson, Eric Daniel, and James L. Koch. *Building a Successful Social Venture: a Guide for Social Entrepreneurs*. Berrett-Koehler Publishers, Inc., 2018.

products and services. Partnering with low-cost producers drives down all company costs and is essential when working in low resource settings. Collaboration partners work closely with the company to implement essential processes. Collaboration partners can range from funders to implementation partners and are often the most involved type of partner. In order to create sustainable and efficient social change, a company needs network, coordination, cooperation, and collaboration partners with distinct values exchanged.

Successful Innovative Partnerships: Case Study 1 and 2

Company Descriptions

Aravind Eye Care was founded to eradicate all needless blindness in India. India has a disproportionately high number of people who are blind, yet most of this blindness is preventable. For example, cataracts, when left untreated, can lead to blindness. Many low-income individuals fail to get any care for their cataracts due to a lack of access and high costs. Aravind Eye Care performs free eye surgeries for low-income individuals and uses eye camps, vision centers, and their own hospitals to perform routine eye check-ups. Aravind operates using a dual subsidy model, where the revenue from Aravind's paying customers (about 30% of their total customers) is used to give care for free to those who cannot afford it (about 70% of Aravind's total customers).

Narayana Hrudayalaya Heart Hospital(NH) was founded to provide affordable cardiac care to the masses. Out of the 2.4 million people who need heart surgery every year, only approximately 60,000 surgeries are performed due to a lack of affordable care. NH utilizes a hybrid strategy of attracting paying patients by its reputation of high-quality care combined with a constant focus on lowering costs of operation to make the care more affordable. The surplus gained from paying patients is used to subsidize procedures for low-income patients.

Through innovative and resourceful partnerships, both of these companies have found ways to maintain high-quality care while decreasing costs so that communities at the margin have equal access to health care.

Table 2. Partnership Analysis for Aravind Eye Care, and Narayana Hrudayalaya Heart Hospital

Company	Partner	Type of Partnerships	Value exchanged by partner
	1. Government of Tripura, Rajasthan, and Gujarat,	Collaboration	Set up vision centers across the State modeled after Aravind's vision centers and using Aravind

Aravind Eye Care ¹⁰¹¹			technology
	2. University of California, Berkeley: Technology and Infrastructure of Emerging Regions Research group	Collaboration	Developed Aravind's wireless networking technology "WiLDNet" that provides a connection between vision centers and the main hospital. Codesigned comprehensive service and deployment of technology and continues to keep technology up to date.
	3. Aurolab	Cooperation	Provides high-quality Intra Ocular Lenses(IOLs) at affordable prices
	4. Eye Camp Sponsors	Collaboration	Funds for organizing and running eye camps
	5. Community leaders and local service organizations	Coordination/Net work	Organize camps, provide food and transportation to hospitals, and utilize local relationships to gain the trust of the community(patient acquisition)
	6. Seva Foundation	Collaboration	Replicating Aravind's Vision Center model globally
	7. Lion's Aravind Institute for Community Ophthalmology	Coordination	Structured training programs for local community members to become highly skilled nurses free of cost
Narayana Hrudayalaya Heart Hospital ¹²	1. Asia Heart Foundation (AHF)	Collaboration	Funds for staff salaries and operation costs of CCU. Funds for the low-cost procedures that NH cannot support.
	2. Biocon Ltd	Cooperation	Provides cheap generic cardio-diabetes drugs for all NH hospitals and clinics in exchange for money
	3. Indian Space Research Organization (Government)	Collaboration	Existing government telemedicine program that provides connectivity for CCU's for free, and provides

¹⁰ Velayudhan Sanal Kumar, Sundaram R Meenakshi. and Thulasiraj R. D. Aravind Eye Care System: Providing total eye care to the rural population. Richard Ivey School of Business, The University of Western Ontario. Retrieved May 2nd, 2018.

¹¹ Brilliant Girija, Brilliant Larry, Aravind: Partner and Social Science Innovator, Innovations, Fall 2007. Retrieved April 29, 2018

¹² Khanna, Tarun, V. Kasturi Rangan, and Merlina Manocaran. "Narayana Hrudayalaya Heart Hospital: Cardiac Care for the Poor (A)." Harvard Business School Case 505-078, June 2005. (Revised August 2011.)

	Agency)		technology for satellite connection (clearer images for cheap).
	4. Government of Karnataka	Collaboration	Sponsor expansion of 30 CCUs→ Expanding government network but monitored by NH
	5. Local Associations (Lions Club/Rotary Clubs)	Coordination	Organized outreach campus for cardiac diagnosis and care.
	6. Local Associations	Network	Brought patients from community to outreach camps, and referred patients from camps to NH for surgery if needed.
	7. Indira Gandhi National Open University(IGNOU)	Coordination (training of specialized doctors)	Training doctors in cardiology (bridging gap of 18,000 doctors graduating every year to 180 newly trained cardiologists every year). The program requires 2 years of training at NH hospitals.
	8. College of Nursing within NH	Coordination(training for specialized nurses)	Training program enables socio-economic empowerment of students from poor remote areas and supplies human capital needed to keep costs low at hospitals
	9. Yeshasvini Trust(Government Program)	Coordination/Network	Utilize existing government cooperative structure to implement an insurance scheme that increases patient access.

Case Study Conclusions

As evidenced by the two case studies above, it is the unique blend of collaboration, cooperation, coordination, and network partners that allows for low-cost, quality care. In Aravind Eye Care, relying on government as a collaboration partner to expand vision centers to rural and urban geographies has increased access at a low cost. In addition, utilizing community leaders as coordination and network partners tailors the care for each community, leading to increased utilization of services and increased quality. Similarly, Narayana Hrudayalaya Hospital utilizes government collaboration partners to expand their critical care units as well as utilize government programs for implementation. NH also utilizes the government structure to increase patient access through coordination and network partnerships. In both these case studies, though there are many stakeholders that lead to efficient care, government partners seem to be the most versatile stakeholders to drive down costs and increase access to quality care.

Innovative partnerships maximize supply and demand elements of care to help drive costs down and increase access. Through partnerships with government and local organizations, social enterprises provide tailored care to communities at the margin. Partnerships with government agencies and hospitals utilize the government infrastructure that already exists to provide quality care and scale to multiple hospitals at once. Local partnerships help drive the

price of care down and innovative subsidizing schemes help bring quality care to those who do not have access.

Strategic Consideration in Pursuing Partnerships: A Real-Time Analysis of CareNX

This section provides a real-time analysis of considerations when pursuing partnerships, based on an enterprises' life cycle. This partnership proposal is based on 68 interviews with mothers, community health workers, and hospital administrators in four states in India.

CareNX Company Overview

CareNX is a social enterprise that has mobilized maternal health care in India. CareNX's three main goals are to bridge the access to standard health care, empower health workers to routinely reach pregnant mothers, and detect high-risk pregnancies before the third trimester.

CareNX has created technologies that have increased access to affordable care and aided in identifying high-risk pregnancies. Through the development of self-screening technologies, CareMother and FETON, CareNX has enabled access to quality care and worked to ensure positive pregnancy experiences. CareMother is a portable diagnostic kit that is sold to government and private hospitals. These hospitals employ community health workers to provide personalized door to door care. The diagnostic test results are uploaded to CareMother's mobile platform and analyzed by doctors who initiate appropriate clinical interventions.

FETON is a smartphone-enabled, portable, fetal heart rate monitor that is nearly three times cheaper than a typical CTG machine. Currently, CareNX is selling FETONs to obstetricians as a way to drive down the price of hospital-based maternal health care. CareNX's ten-year goal is to use their products to create an ecosystem of self-monitored maternal health care.

Partnership Considerations for Scaling

CareNX has created technologies that have increased access to affordable care and aided in identifying high-risk pregnancies. CareNX's ten-year goal is to use its products to create an ecosystem of self-monitored maternal health care. To achieve this goal requires integrated system optimization between technology, health workers, and institutions. By itself, innovative technology will not solve the healthcare crisis. Caremother holds up the promise of increased health return on investment when utilized efficiently by partners. Currently, technology, health workers, and institutions have not efficiently aligned their individual goals to increase access to healthcare in India. This is largely due to the inefficiency in partnerships. With over 15 partners working in different geographies and each serving differing functions, the partnerships inefficiencies lead to inconsistent implementation strategies which results in a lower standard of care.

Many of CareNX's partnerships are funded mainly by corporate social responsibility grants which work efficiently in the beginning stages of the enterprise but is not financially

sustainable for growth and scaling. The large number of partners increase transaction costs and make scaling nearly impossible due to conflicting management systems.

Innovative Partnerships have the potential to improve healthcare access by combining government, for-profit, and nonprofit resources and health management systems. Entering innovative partnerships that collaborate with government entities is a key strategy for CareNX to transition from dependency on short-term grant funding to new forms of revenue, and this provides a pathway to easily scale across India through the government.

The path to scaling requires different partnerships based on the enterprise life cycle stage. The enterprise life cycle has four main stages: startup, growth, maturity, and rebirth/decline. As a business progresses from initial stages to maturity, the financial and capital resources needed to support expansion shift dramatically. This chapter provides three different strategies for CareNX to utilize innovative partnerships as it moves through the startup, growth, and mature stages of the enterprise life cycle. These strategies include partnering with an NGO, entering a Tri-Party-Partnership, and partnering with the government.

Summary of Findings Table

Strategy	Advantages	Disadvantages
Startup Phase: Partnership with NGO	<ul style="list-style-type: none"> ● Makes NGO more efficient ● Gives CareNX exposure to how successful PPPs look ● Builds trust with the Government 	<ul style="list-style-type: none"> ● Separates CareNX from negotiating terms of PPP ● Limits CareNX to NGO's geographic reach ● Indirect link to government funding
Growth Phase: Tri-Party Partnership	<ul style="list-style-type: none"> ● Makes NGO more efficient ● Access to government health care infrastructure ● Access to NGO's community relationships ● Autonomy over terms of the partnership ● An optimal strategy for Scaling 	<ul style="list-style-type: none"> ● Coordinating with three entities can be a hassle ● Need monitoring and evaluation strategies to ensure efficiency
Maturity Phase: Partnership with Government	<ul style="list-style-type: none"> ● Access to government health care infrastructure ● Autonomy over terms of the partnership ● An optimal strategy for scaling 	<ul style="list-style-type: none"> ● Lower standard of care at government health setups ● Inefficient government health care management ● Inconsistent government Implementing strategy

Startup Phase: Enter PPP Through Partnership with an NGO

Many NGOs have entered into PPPs with the government in India's health care sector including Karuna Trust, Apollo Hospitals, and Tata Trust. Providing NGOs with CareNX's mobile maternal health care solutions enables NGOs to be more efficient in their care delivery, thus enabling them to reach more mothers. Approaching a PPP through an NGO allows CareNX to familiarize itself with the PPP model while building trust with the government. This approach capitalizes on the existing relationship between the NGO and the government and uses the government's financial resources to facilitate scaling. When an enterprise is in its startup phase, resources are scarce and facilitating complex and innovative partnerships can be difficult. Direct partnership with an NGO utilizes an existing partnership to help start to grow the enterprise.

One constraint to approaching the PPP model through an NGO is CareNX would be separated from negotiating the terms of the partnership. The partnership and implementation process would be solely based off of the NGO's preset terms with the government. In addition, CareNX's social impact and scaling are limited to the NGO's reach; there would be limited autonomy in moving to new geographies. Compared to engaging in a direct PPP with the government, this indirect link to government funding weakens the efficiency of the PPP model for sustainable growth.

Growth Phase: Tri-Party-Partnership

A Tri-Party Partnerships includes a for-profit company, an NGO and the government. In the ideal Tri-Party-Partnership,

“The public sector can bring in the vast infrastructure that it has across the country; the for-profit companies have the potential to bring in required skills and expertise along with physical resources, whereas the non-government organizations can bring on board its knowledge and expertise in understanding the community”¹³.

¹³ Chakravarty, Nayan, et al. "Mapping Private-Public-Partnership in Health Organizations: India Experience." *International Journal of Medicine & Public Health*, vol. 5, no. 2, Apr-Jun2015, pp. 128-132.

The government can provide financial resources and infrastructure to disseminate care throughout the country. CareNX can utilize an NGO's community health workers and existing health care management for implementation of its solutions. Working with an NGO allows CareNX to capitalize on the trust NGOs have worked to build in communities. As the for-profit company in the Tri-Party-Partnership, CareNX would provide technological solutions to bridge gaps in maternal health care. The Tri-Party-Partnership utilizes the unique strengths of each party, thus maximizing efficiency and increasing impact. As the enterprise is growing, they utilize the relationship they built with the NGO during the startup phase but gain more autonomy over the partnership through their partnership with the government.

Negotiating the terms of this PPP model may be difficult, as each party needs to gain and contribute to the partnership. For long term success and scaling, the impact of each partner needs to be monitored to ensure all parties are contributing adequately. The downside to a tri-party partnership is that there are many stakeholders in the partnership, which leads to high transaction costs.

Mature Phase: Partner Directly with the Government

In this strategy, the government provides a link to extensive health care infrastructure. This PPP model depends on working with government hospitals with outreach departments focusing on serving low-income communities. The outreach department of the hospital works as the implementing agency. This strategy is optimal for scaling as the government health infrastructure is consistent throughout all of India. Government partnerships often can be tricky due to politics but once the enterprise is in the stable mature phase, appropriate time and resources can be devoted to making this partnership efficient and sustainable.

The biggest problem with utilizing government hospitals is that many are inefficiently managed. With a sole partnership with the government, hospital management doesn't change and therefore delivery of care may remain inefficient. Also, as there is no clear implementing agency, relying on the government to implement CareNX's technological solutions may lead to inconsistencies. Solely partnering with the government limits CareNX's reach to government hospitals with

outreach departments. This may lead to holes in monitoring, as CareNX would primarily be working with government administration, who are further removed from implementation than an NGO's community health workers.

Studies have found that the PPP model is likely to be most appropriate in situations where the existing provision of health care is inadequate in terms of productive efficiency or quality.¹⁴ Many private companies merely provide technological solutions and cannot bridge the gaps of quality and efficiency alone. The government needs to identify a consistent implementation strategy. There are currently inefficiencies in the government's approach to providing maternal health care. It is imperative that government administration is willing to make large systematic changes for the sake of efficiency.

Conclusion

Though there have been modernization and expansion effects in public and private health facilities, the state of health care in India right now is still characterized by high costs, low quality, and poor management. The World Bank estimated that a quarter of all Indians are pushed into poverty as a direct result of medical expenses due to the high-cost burden of private health care in India. Conversely, the public system offers free health services to all income brackets but is underutilized due to the poor quality of healthcare. Both systems currently have fundamental flaws which lead to an inability to meet the burden of disease in low-income communities. Working independently, public and private health institutions in India cannot bridge the gaps in health care access and quality.

Innovative partnerships have the potential to improve equity, efficiency, accountability, quality and accessibility of health care. By partnering with organizations across all sectors of health care delivery, innovative partnerships can increase access to resources, technology, knowledge, and management practices.

If the government had no financial constraints, it would still take many years to completely rebuild their health system to improve all the inefficiencies that currently exist. Partnering with private institutions can maximize the supply and demand elements of health care,

¹⁴ Krupp, Karl and Purnima Madhivanan. "Leveraging Human Capital to Reduce Maternal Mortality in India: Enhanced Public Health System or Public-Private Partnership?" Human Resources for Health, vol. 7, Jan. 2009, pp. 1-8. And, Balasubramanian R, Rajeswari R, Vijayabhaskara RD, Jaggarajamma K, Gopi PG, Chandrasekaran V, et al. "A rural public-private partnership model in tuberculosis control in south India." Int J Tuberc Lung Dis 2006.

through the utilization of existing solutions, to provide efficient and low-cost care to communities at the margin. Social enterprises are poised perfectly to coordinate between public and private hospitals to help facilitate partnerships that utilize new innovation and existing infrastructure to deliver quality care.

Partnerships are dynamic and are constantly evolving as an enterprise or institution grows. The path to scaling requires different partnerships based on the enterprise life cycle stage (startup, growing, stable). Setting the foundation for sustainable partnerships at the startup phase of an enterprise is key to successful and sustainable partnerships during the growth and maturity phase. Currently, CareNX is not utilizing efficient partnerships and therefore needs to strategically reconsider their partnerships before geographic and product scaling. Through the strategies for partnership mentioned above, CareNX will be better suited to expand their reach to the rest of the country and world.

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