



HEALTH

BUSINESS MODEL OPTIMIZED INTERNAL PROCESSES
BOP IMPACT PATIENTS
CONNECTIVITY HIGH SPEED

Narayana Health

Affordable Quality Healthcare for the Masses in India

Founded in 2011, Narayana Health (NH) is a private group of hospitals in India that leverages ICT and broadband to increase its efficiency and provide quality healthcare at affordable prices. NH is a profitable social business serving over 80,000 patients per month in one of its 24 hospitals or remotely via tele-medicine. NH has also been active in the promotion of insurance schemes for economically disadvantaged households in order to further contribute to its social mission of “affordable quality healthcare for the masses.” It is now scaling up internationally, with new hospitals opening in the Caribbean and Malaysia in 2014.

Role of Broadband and Data Connectivity

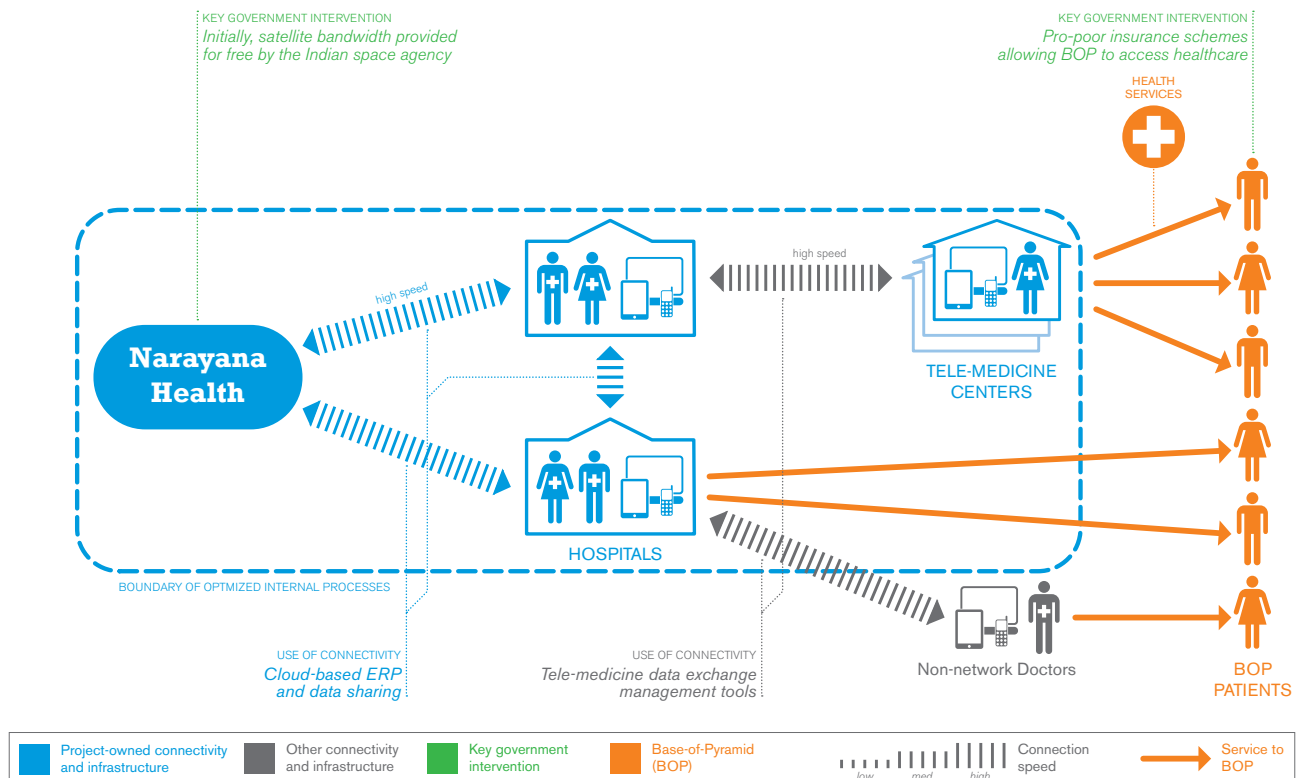
The use of broadband enables remote diagnosis and tele-consultations, real-time access to medical data across the group, and optimization of management efficiency thanks to a cloud-based enterprise resource planning (ERP) system. The NH CEO estimates that the use of technology, broadband,

and data connectivity leads to “around 75 percent cost reduction as compared to a traditional hospital,” thus enabling NH to offer affordable healthcare to its patients, 50 percent of whom are from the BOP. The minimum connectivity requirements for one hospital range between 1 Mbps for small facilities offering only consultation and diagnoses to 4-8 Mbps for medium-size and large hospitals.

Key Success Factors

The NH business model requires a critical mass of patients, so hospitals must be located in densely populated urban centers and leverage insurance schemes that allow for serving the majority. NH can only work if there is availability of skilled human resources – not just doctors but also nurses and paramedical staff, which allows doctors to use all of their time on the most critical part of the work. Lastly, broadband has lowered costs of operations compared to previous expensive alternative methods (e.g., satellite connection for tele-consultations) and thus allowed for reaching the BOP.

System Diagram: Narayana Health



Implications for Policymakers

For the model to reach the BOP, policymakers should promote insurance schemes. In order to be sustainable, these schemes should ideally rely on contributions from all parties: beneficiaries, government, and hospitals. To cope with the need for skilled staff, policymakers also need to encourage medical human resource training by creating schools and adapting regulations. Lastly, pushing the development of broadband infrastructures is crucial to the efficiency of the NH model.

Website

www.narayanahealth.org



Description of Business Model

History of Organization

Formerly the Narayana Hrudayalaya Hospital Group, Narayan Health (NH) is a private group of hospitals founded in 2001 by Dr. Devi Shetty. It provides low-cost healthcare to a diverse patient base in India. Over the years NH has expanded out from its initial focus on cardiac services and now handles cases in neurology, pediatrics, nephrology, urology, and gynecology. In 2013, the group had 24 hospitals (including four major health centers called “health cities” in Bangalore, Ahmedabad, Jaipur, and Kolkata), comprised of 97 operating theaters and 6,400 beds, and serving over 80,000 patients per month. NH provides more than 10 percent of the cardiac services in India, with each hospital performing about eight times more surgeries per day than India’s average. New locations will be opened in the Cayman Islands and Kuala Lumpur in 2014.

NH is recognized for its contribution to the development of low-cost insurance schemes, and in particular the Karnataka Yeshasvini Health scheme, which Dr. Shetty initiated in 2003 for poor farmers and which is now reaching 3 million household members. NH has also been innovative in the field of tele-medicine: the group has offered tele-consultations and distance diagnoses in remote areas since 2002. The number

of NH tele-medicine and tele-ECG (electrocardiogram) centers in India has grown to 160 and 590, respectively. Lastly, NH is part of a government of India initiative in Africa (Pan-African e-Network Project) to offer tele-consultations and train medical workforces via videoconference.

Founder and Chairman Dr. Devi Shetty was named Entrepreneur of the Year by Ernst & Young in 2003 and Citizen Extraordinaire by Rotary in 2004. He was awarded the Social Entrepreneurship Award by the World Economic Forum in 2005 and The Economist’s Innovation Award 2011. In 2012, he was named Economic Times Entrepreneur of the Year, Indian of the Year (by CNN-IBN), and received the Lifetime Achievement Award (from FICCI). The NH group as a whole received the India Shining Star CSR Award 2011 and the FICCI Healthcare Excellence Award 2012, and was named Healthcare Service Provider Company of the Year 2012. In the same year, Fast Company ranked NH best in “The Top Ten Innovative Companies in India,” second best in “The World’s Top 10 Innovative Companies in the Healthcare Industry,” and 36th among the “World’s 50 Most Innovative Companies.” The quality of services at NH was also recognized, as two hospitals (Jaipur and Bangalore) received accreditation from Joint Commission International, and five others obtained the National Board Accreditation.

Value Propositions

NH offers a broad range of quality healthcare at low cost in its 24 hospitals and outside its network through tele-medicine. Medical treatment and surgeries are available at different price levels. BOP patients can get discounted prices based on scanning done by NH's charitable wing. For instance, only 40 percent of the over 11,000 cardiac surgeries performed in 2013 were billed at the full price of INR 150,00 (US\$2,500) which is still 25-35 percent lower than the average Indian price, and at least eight times lower than the price in the United States. Tele-consultations and remote diagnoses in tele- ECG centers are provided for free.²⁷ Some patients even receive free treatment. Lastly, the quality of NH hospitals attracts international patients (5-6 percent of total in 2013).

Technology Aspects

The NH CEO estimates that the use of technology and broadband leads to "around 75 percent cost reduction as compared to a traditional hospital."²⁸

27 NH used to sell trans-telephonic ECG devices in order to provide remote consultations. The technology has evolved quickly and chronic disease monitoring is now mostly done via smartphones or tablets in developed areas. NH is still providing services to health centers equipped with the ECG technology, but mostly in remote rural areas. The group is now working on the development of an app for smartphones or tablets.

28 In order to optimize its cost-efficiency NH has developed further strategies that do not directly leverage broadband. These strategies include developing a low-cost cardiac hospital model to reduce the cost of building hospitals in smaller towns (typically 100-200 bedded surgical hospitals primarily built as a pre-fabricated ground floor structure with minimal reinforced concrete construction and optimal use of natural daylight to reduce energy consumption); and extending the life of medical equipment through proper servicing (done through a joint venture with a U.S. firm called Trimedx, a subsidiary of Ascension Health). This has allowed NH to lower the construction cost of new hospitals to an average cost per bed below \$30,000 (when typical hospital construction costs are more around \$58,000 per bed), which makes NH's hospital construction costs among the lowest in the country.

Remote diagnosis and tele-consultations: NH has developed this tele-medicine service in collaboration with the Indian Space & Research Organisation. For videoconferencing with patients, NH used to rely on satellite technology, but is now mainly using broadband (including mainstream tools such as Skype). NH is one of the largest tele-medicine facilities in India, with 590 tele-ECG and 160 tele-medicine centers. NH also provides its services to 53 locations in Africa and 10 other locations outside India.

Real-time access to medical data across the group: NH was the first group in India to integrate all its hospital units through a cloud-based system (ERP and medical data). Real-time access to medical data avoids having a specialist in every location (e.g., a specialized radiologist can analyze an MRI or X-ray remotely) and hence reduces costs. NH is also using its cloud-based image management system to offer doctors' consultation services to other hospitals (14 client hospitals in India in 2013).

Optimization of management efficiency: NH uses its cloud-based ERP to optimize its processes. For instance, NH tracks profits and losses on a daily basis, sending updates to doctors and administrators electronically in order to encourage cost efficiency. NH further uses the Internet to deliver digitalized medical documents via email upon patients' requests as well as to communicate with their insurance companies about coverage and billing.

NH has partnered with ICT companies to develop its cloud-based system. The main server, storage, and WAN environment are outsourced. Instead of making large investments, NH has opted for a pay-per-use contract with IT service providers. This also avoids maintenance costs on physical infrastructure. In total, NH estimates that this option is saving ~65 percent costs over a conventional IT system. The data security processes and protocols are also outsourced. However, NH retains the right to audit the facility and the network security at any point in time.



Business Design

Operations and distribution: NH provides healthcare services to over 80,000 patients per month either on site or in one of its 24 hospitals or through its tele-ECG and tele-medicine centers. In 2013, NH treated a total of ~115,000 in-patients and ~930,000 out-patients.

Staff training: NH provides training to its staff through the NH Training and Organizational Development Department, either in person or through computer-based training. NH also promotes post-graduate programs for doctors and the Nursing Institute affiliated with the Indian Nursing Council and Rajiv Gandhi University.

Marketing and consumer education: NH has built a strong rural network throughout India, establishing linkages with small family practices. It also has deployed mobile outreach vans to find new patients and have them benefit from free diagnosis at a nearby tele- ECG center. Health insurance also sends many patients to NH.

Business model: NH revenues come mainly from its healthcare operations, with cash-paying patients accounting for ~40 percent, patients registered under government/ micro-insurance schemes ~30 percent, privately-insured patients ~30 percent, and services to hospitals outside the network less than 1 percent. NH receives no subsidy from the government, but it does receive grants from private companies or individual philanthropists to build its infrastructure (e.g., its new hospital for children in Mumbai is mostly paid with donations).

Payments are always made in advance: Thus, the price of surgery is independent of how long a patient stays in the hospital. Insured patients can receive cashless outpatient consultations.

Policy and regulations: Governments adopted the insurance scheme initiated by Dr. Shetty, which is key to NH success for the BOP

The Indian government has announced its intention to bring the Internet to 600 million citizens by 2020. In 2013, it launched the National Optical Fiber Network (NOFN) project, which aims to connect over 200,000 gram panchayats²⁹ with optical fiber by 2016 (at least three Internet connections and one Wi-Fi hotspot in each gram panchayat). Service providers are given non-discriminatory access to the fiber network. The recent improvement of broadband access in India has led to significant efficiency gains for social businesses, and NH is now using mainstream Internet tools (e.g., Skype) instead of satellite connections

²⁹ Smallest Indian administrative division, typically three villages of 200-500 households each.



Evaluation Framework

Is the project solving the problem?

Problem Magnitude

In India, only 100,000-120,000 cardiac surgeries are performed out of 2 million needed yearly. Costs are prohibitively high for a majority of the population, and 70 percent of the population lives in rural areas while 80 percent of doctors are located in urban areas. On a global scale, cardiac care is not affordable for 80-90 percent of the population, even though rates of heart illness are growing.

Solution Provided

Service quality and comprehensiveness: NH is very active in the health value chain, from training medical staff to promoting insurance schemes and delivering healthcare services at low cost in its hospitals and in remote areas via tele-medicine.

Tool quality: NH has world-class technologies for surgery, and tele-medicine tools developed with the Indian Space & Research Organisation. The tele-medicine system consists of customized hardware and software at the patient's and doctor's ends with diagnostic equipment like ECGs, X-rays, and pathology microscope/cameras provided at the patient's end. The quality of services is proven by the accreditations that NH has received. For instance, a recent Harvard University paper underlined that NH's 30-day post-surgery mortality rate for coronary artery bypass procedures at the

Bangalore hospital is below the average rate recorded by a sample of 143 hospitals in Texas (Govindarajan, 2013).

Scale and Reach

Broadband activities: NH has conducted over 350,000 remote diagnoses (over 100,000 or about 10 percent of diagnoses in 2013 alone) and over 50,000 tele-consultations to date. NH used to rely on satellite for video-conferencing but is now using Skype and other mainstream broadband-based tools. Its cloud-based ERP and data system connecting all hospitals use data flows of ~50GB per day.

Overall medical services: 24 NH hospitals (including four "health cities"), 160 tele-medicine centers, and 590 tele-ECG centers receive over 80,000 patients monthly. More than 80,000 cardiac surgeries have been performed since NH's inception (over 11,000 in 2013 alone). Cardiac surgeons perform 400-600 procedures per year, which is three times more than the U.S. average.

Growth rate: NH experienced over 35 percent year-on-year growth rate from its inception in 2000 to 2011, 27 percent in 2012, and ~30 percent in 2013.

Acceptance and Usage

Acceptability: NH has gained patients through quality services at affordable prices.

Usability: Healthcare services widely available across the country thanks to tele-medicine.



Socio-economic Impact

Social outcomes: NH provides healthcare services at the BOP (50 percent of patients). Many treatments are provided below costs: 54,000 cardiac patients were treated for free in 2013.

Economic impact: Positive impact on the economy through quality healthcare at low cost for the BOP (not measured).

Gains in efficiency due to technology: Access to quality healthcare even in remote areas.

Environmental impact: Not measured

Other impacts: NH promotes job opportunities at the BOP by encouraging medical training, in particular through scholarships for medical studies (in West Bengal).

Economically sustainable?

NH is a profitable social business that generated ~\$US140 million in revenue in 2013. Each new hospital is able to break even within 12-14 months. BOP patients access healthcare services at discounted price or for free.

At the patient level:

Direct cost of services: Free remote diagnosis services. Some direct services at discounted prices based on the customer's ability to pay. The most common cardiac surgery (coronary artery bypass graft) costs ~US\$2,500 (US\$1,200 for insured patients).

Additional indirect cost: Transportation to point of care or tele-medicine.

Average household income: Very diverse target groups.

Ability to reach the poorest: Among NH patients, 50 percent are at the BOP.

At the Narayana Health level:

Total number of people employed at central level: 1,300 full-time doctors and 12,500 staff.

Annual turnover: ~US\$140 million in 2013.

Profit margin: Over 10 percent earnings before interest, taxes, depreciation, and amortization (not accounting private grants), although NH commissioned 10 new hospitals in 2013 that have not yet broken even (it takes 12-14 months for a hospital to break even). For surgery costing ~US\$2,500, around one-third goes to salaries.

Initial and ongoing funding: Various sources of funding, financial institutions hold about one-quarter of NH capital.

Cost-recovery level: Each new NH hospital is able to break even within 12-14 months (this is also true for hospitals that did not receive donations for their infrastructure).

Scale and BOP Reach

80,000 patients treated every month in one of the 24 hospitals of the group or remotely via tele-medicine; 50 percent of patients are from the BOP.

Sustainability

NH is a profitable social business that generated ~\$140 million revenue in 2013. Each new hospital breaks even within 12-14 months. BOP patients access healthcare services at discounted price or for free.

Replicability

Good potential for replication provided a critical mass of patients can be reached (requiring policymaker support for BOP insurance schemes, and no market distortion against private hospitals), qualified manpower is available, and broadband connectivity is sufficient.

Scalable?

What have been the key challenges and success factors to date for the project?

Overcoming import duties for parts used in off-patent technologies (production expansion currently limited by high duties and rising costs of parts).

Continued donations through trusts, individual donors, or by the hospital as cross-subsidies to sustain concessional rates.

What are key challenges today to scale further?

Overcoming regulatory hurdles of the Medical Council of India to facilitate the opening of medical schools for doctors, nurses, and paramedical workers. Having skilled paramedical staff is critical to ensure that doctors optimize their working time.

Obtaining an increase in the payout from government insurance schemes: These payouts have not been revised for the past three years, in spite of costs going up dramatically due to inflation and wage increases. Today, the scheme is sustained only because of cross-subsidies between paying patients and patients from the scheme.

Replicable at scale?

What are external prerequisites for the project to be replicated in a new country?

Involvement of policymakers in the creation of sustainable insurance schemes.

Availability of manpower: In some countries, medical training is poor and there are severe restrictions on attracting resources from outside.

Broadband connectivity: At NH, the minimum connectivity requirements for one hospital range between 1 Mbps for small facilities offering only consultation and diagnoses, to 4-8 Mbps for medium-size and large hospitals.

Additional Information

Exchange rate used for this case study:

1 USD = 60 INR

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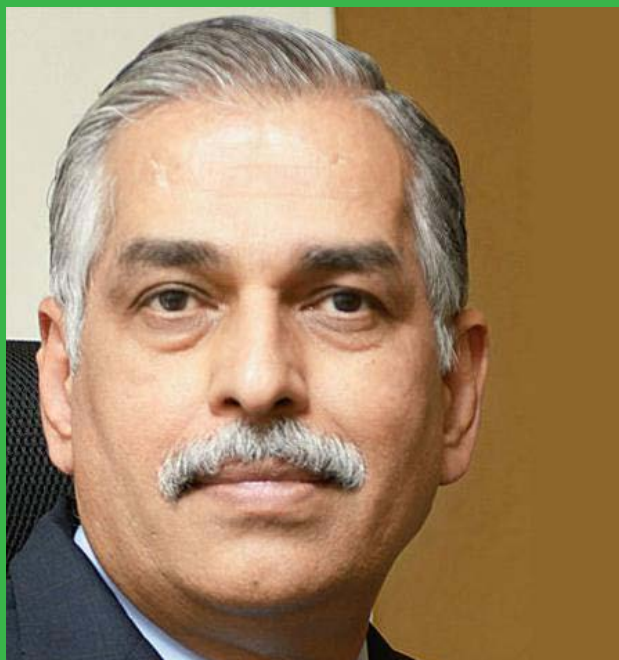
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Dr. Ashutosh Raghuvanshi, MD

Vice Chairman and Group CEO

Dr. Ashutosh Raghuvanshi joined NH as a Senior Cardiac Surgeon. He is credited with the establishment of the Rabindranath Tagore International Institute of Cardiac Sciences, Kolkata, which he joined as director in 2000, and which is today one of the largest multi-specialty hospitals in Eastern India. In 2009 he was appointed as the Vice-Chairman & Group CEO and Executive Director of the NH Group. In 2011, he was appointed the Managing Director of NH. In this role, he is responsible for the administration of all the group hospitals. He is also pioneering the growth of NH by actively pursuing new opportunities for expansion and setting up new hospitals across the country and abroad.



What are your next steps and future plans?

Our long-term goal is to become a 30,000-bed organization with surgery priced at US\$800, following NH's social mission: 'Affordable quality healthcare for the masses.' In the short term, we plan to open new hospitals in India and internationally by leveraging joint ventures. We want to continue improving our efficiency by leveraging technology (e.g., development of an iPad app for the intensive-care unit). Another key development is the setting up of low-cost hospital infrastructure (we have a current pilot in Mysore).

What recommendations would you give to an entrepreneur willing to replicate your model in Latin America?

I would first recommend opening the first hospital in a high-density area, ideally where people have insurance schemes, in order to get a critical mass of patients allowing economies of scale. Then, the initial capital expenditures should be limited: the size of the hospital should be modular and grow as more patients come in. Pay-per-use contracts with ICT providers participate in this modularity.

What recommendations would you give to a Latin American policymaker who wants to encourage replication of your model?

I think they should first create insurance schemes that rely on contributions from all parties: beneficiaries, government, and hospitals. Payouts to providers need to be sufficient in order to be sustainable. They should also encourage human resources training, including among the economically disadvantaged population (for instance, through scholarships that would enable them to attend medical training). Training of paramedical staff is key to ensure that most qualified doctors optimize their time.

What support would you request from a public or private donor?

I would request support in building infrastructure for manpower training, and in building hospital infrastructure.