Narayana Hrudayalaya Hospital

"When doctors are not aware about the cost implications they always tend to ask for the fastest scanner and the most expensive medicine. But there is a limit…In one week you can teach them about finance. It is not very difficult. And it will be very hard for a finance man to learn about medicine. So it's much easier for a doctor to be taught about finance management."[1]

Challenges

In India, the dual pressures of poverty and a large population make effective healthcare delivery especially challenging.[2] There is no national health system and health spending accounts for 4.2 per cent of GDP, compared to 9.8 per cent of GDP in the UK.[3] Private health spending represents 73.8 per cent of health spending, the highest proportion in the world, in comparison private spending represents 18.3 per cent of all UK health spending. Of private spending on health in India, 90 per cent is out of pocket, with two out of five hospital interventions paid for by individual loans or the sale of assets.[4]

The large rural population of India means that access to healthcare is low, with less than one doctor per 1,000 people and 1.1 hospital beds per 1,000 people.[5] Although 72 per cent of India's population lives in rural areas, 80 per cent of doctors, 75 per cent of dispensaries and 60 per cent of hospitals are in urban areas.[6] In addition, 78 per cent of health infrastructure is secondary care services, with 11 per cent primary and 11 per cent tertiary. The primary care network suffers from severe staff shortages with most clinicians preferring to live and work in urban areas.

Increasing the health resources of the nation requires substantial investment. To achieve the target of two beds per 1,000 population by 2025, an additional 1.75 million beds are needed.[7] Similarly, to reach a ratio of one medical doctor per 1,000 individuals by 2025, an additional 700,000 doctors will be required.[8]

Heart disease

Indians are generally three times more susceptible than Europeans to heart attacks. Every year, 2.5 million people require heart surgeries, yet the combined capacity of Indian hospitals totals less that 90,000 surgeries a year.[9]

Method

"Walmart approach"

India needs low cost, high productivity care. Focused business models delivering specialist care have allowed health providers to dramatically reduce costs and maximize work force productivity. Narayana's guiding mission is to bring high cost and complex healthcare to the poor. There is a sense among the medical and non-medical staff of belonging to the institution and ownership of its objectives. Narayana Hrudayalaya was established in 2001 by the world renowned heart surgeon Dr Devi Shetty. It has since become Asia's largest cardiac center and attracts patients from 76 countries. The 1,000 bed cardiac hospital is part of 5,000 "health city" spread over 25 acres in Bangalore in South India. Organizing health care at such scale has enabled to Narayana to achieve higher volumes at lower costs and better quality.

Specialisation

Narayana Hrudayalaya delivers a limited range of medical services, but at far larger scale. This lowers costs and improves outcomes. Narayana's 1,000 bed heart hospital performs 35 heart surgeries a day on average and a maximum of 60 a day in its 24 operating theatres.[10] Machines, equipment and facilities – a large proportion of cardiac surgery costs – are used at a much higher rate, bringing down per unit costs. By comparison the largest specialist heart

1 Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less.*
2 The World Bank estimates that GDP per capita in India is $1,192, compared to GDP per capita of $35,165 in the UK.
3 World Health Organisation (2009); OECD (2010), *Health data.*
4 Kothandaraman, P. and S. Mookerjee (2007), "Healthcare for All: Narayana Hrudayalaya, Bangalore", *Growing Inclusive Markets,* United Nations Development Programme.
5 Ibid. The UK has an average 2.7 doctors per 1,000 population and an average 3.3 hospital beds per 1,000 population.
6 KPMG (2011), *Indian Healthcare System Overview*.
7 Ibid.
8 Ibid.
9 Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less.*
10 Ibid.

hospital in England has 270 beds and 5 operating theatres, and has 58 operating sessions a week.[11] As Dr Devi Shetty argued at *Reform's* health conference *A lot more for a lot less*, "Healthcare is all about numbers. When we do 60 major heart surgeries a day your results will always get better."[12]

Intensive work

Doctors at Narayana are paid the Indian average, but work to a much higher level of productivity. Heart surgeons at Narayana perform an average of two or three procedures a day, six days a week. They typically work 60 to 70 hours a week.[14] 35 per cent of surgeons' pay is based on performance.[15] NHS surgeons would normally undertake 150-200 procedures a year, and under the consultant contract, hospital consultants' basic salary is based on 40 hours a week of ten programmed activities of four hours, additional programmed activities beyond 40 hours a week are paid for at plain-time or premium time rates.[16]

"We have a lot of rules and regulations about what is a quality of every person involved in the healthcare. When somebody does an appendix operation the person who hands over the instrument has to be a BSc in Nursing. Is it required for that qualified person to do this?"[13]

Maximizing consultant time and low skilled staff

While healthcare in the NHS and the West in a high skilled industry, Indian innovators have challenged professional assumptions about what functions different health workers can perform.[17] Narayana's workforce is led by 42 internationally trained and experienced consultant surgeons.[18] Senior doctors occupy similar roles to the NHS, providing consultations for patients, meeting surgical candidates, leading operations and discharging patients. However their productivity is significantly higher. Surgeons do between 1-5 operations and 70-100 consultations a day. Consultant productivity is maximised through using their time effectively and the support of lower skilled staff.[19] Junior surgeons would open and close surgical procedures while consultants would only do the most complex part of the operation. Allowing them to spend one hour on a six hour operation, and often do two procedures at once. In addition Narayana make much greater use of pre-graduate doctors and low skilled staff, often in the form of non-clinical employees trained in specific tasks.[20]

Financial responsibility and clinical leadership

At Narayana clinical leadership is a reality, doctors are accountable for the costs and quality of healthcare as well as the benefits. Clinicians, as well as managers, are focused on financial management. At Narayana profit and loss is studied daily. At 12.00 pm every doctor and administrator gets an SMS text message with the profit and loss account of the previous day.[21] The high level of standardisation of surgical procedures ensures the consistency of costs.

Key to the high level of outcomes in Narayana is harnessing the competitive nature of doctors.[22] Transparency of outputs and outcomes for each surgeon is monitored, shared and peer pressure creates the incentives for constant improvement. Data is used to create and improve clinical guidelines and a decision aid for surgeons. Waiting times and outcomes for operations are measured for each surgeon. Lower level clinicians are accountable for specific clinical procedures and outcomes, for example nurse managers are responsible for monitoring and reducing the rate of bed sores, while specialist intensive care practitioners are accountable for the performance of the ICU.

11 Papworth NHS Foundation Trust (2010), *Annual Report*.
12 Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less*.
13 Ibid.
14 Anand, G. (2009), "The Henry Ford of Heart Surgery", *The Wall Street Journal*, 21 November.
15 The Society for Cardiothoracic Surgery in Great Britain & Ireland (2008), *Sixth National Adult Cardiac Surgical Database Report 2008.*
16 National Audit Office (2007), *Pay Modernisation: A new contract for NHS consultants in England*.
17 See Fulton, D. et al (2011)," Health workforce skill mix and task shifting in low income countries: a review of recent evidence", *Human Resources for Health*, Vol 9.
18 Narayana Hrudayalaya (2011), narayanahospitals.com.
19 Khanna, T. et al (2005), "Narayana Hrudayalaya Heart Hospital: Cardiac Care for the Poor", Harvard Business School.
20 India Knowledge (2010),"Narayana Hrudayalaya: A Model for Accessible, Affordable Health Care?" Wharton School.
21 Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less*.
22 Ibid.

Technology and community services

The use of telecare to bring expert medical care to the local level remains limited in the NHS. In the developed world consultants have been reluctant to maximise productivity through technology and working outside the hospital. Dr Shetty has developed community cardiac services to improve access for the rural poor. Smaller Coronary Care Units (CCUs) are linked to the major cardiac centres and GPs are trained to provide checks and administer basic treatment. Hospital based specialists provide consultations through the internet and videoconferencing. To date 53,000 patients have been treated this way. Only 1 per cent of cases treated in CCUs require surgery.[23]

Outcomes

Low cost

"At 12.00pm every doctor – every senior doctor, every administrator gets the SMS with the profit and loss account of the previous day. We keep an eye on the profit and loss account (P&L) on a daily basis. If you get the P&L account at the end of the month, it is a post mortem. The patient is dead. If you get the P&L account on a daily basis, it's a diagnosis and you can treat."[24]

Narayana delivers cardiac care at a cost lower than any other hospital in India and at a fraction of what it would cost elsewhere in the world. In the NHS, the tariff cost for cardiac surgery ranges from £8,226 to £11,757 depending on the level of complexity.[25] In India, cardiac surgeries typically cost around US$5,000-US$7,000 (£3,100-£4,340).[26] At Narayana Hrudayalaya, surgeries cost less than US$1,800 (£1,116), irrespective of the complexity of the procedure or the length of hospitalisation.[27]

High quality

Narayana's mortality rate of around 2 per cent and hospital-acquired infection rate of 2.8 per 1,000 ICU days are comparable to the best hospitals across the world. [28] There is a 1.4 per cent mortality rate within 30 days of coronary artery bypass graft surgery, one of the most common procedures, compared with an average of 1.9 per cent in the U.S.[29] According the European Association for Cardio Thoracic Surgery the mortality rate for England was 1.8 per cent, while the European average is 2.4 per cent.[30] The complication rate is 1.7 per cent, by comparison in the UK the re-operation for bleeding or other problems is 4.9 per cent for 2004-8. Narayana's performance would be even better if justified for risk.

23 Khanna, T. et al (2005), "Narayana Hrudayalaya Heart Hospital: Cardiac Care for the Poor", Harvard Business School; Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less.*
24 Ibid.
25 Department of Health (2011), *NHS Payment by Results 2010-11: National Tariff Information*; National Audit Office (2010) *Management of NHS Hospital Productivity.*
26 Dr Devi Shetty, in *Reform* (2011), *A lot more for a lot less.*
27 Ibid.
28 India Knowledge (2010),"Narayana Hrudayalaya: A Model for Accessible, Affordable Health Care?" Wharton School.
29 Anand, G. (2009), "The Henry Ford of Heart Surgery", *The Wall Street Journal*, 21 November.
30 Eurpean Association for Cardio Thoracic Surgery (2010), EACTS Adult Cardiac Surgical Database. Individual Country Report for England.