L V Prasad Eye Institute

“Several factors motivated me to change the way eye care is provided in India: a lack of attention to quality in the previous system and a lack of equity in care, combined with the magnitude of the need. We encountered challenges but, after the successful development of a secondary care eye center for underserved rural areas and reviewing the data from the Andhra Pradesh Eye Disease Study, we saw the opportunity for a new model of care that could address the huge and unmet need.”

–Dr Gullapalli N. Rao, Founder and Chair

Characteristics

<table>
<thead>
<tr>
<th>Country</th>
<th>India</th>
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<tr>
<td>Target Population</td>
<td>General population</td>
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<td></td>
<td>Poor/Low-Income</td>
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<td>Infants and/or young children, ages 0 to 4</td>
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<td>Children and/or youth, ages 5 and older</td>
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<td>Girls</td>
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<td>Boys</td>
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<td>Older Adults and elderly</td>
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<td>Disabled</td>
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<td>Geographical Reach</td>
<td>Regional (within India)</td>
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<td>Urban</td>
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<td>Rural</td>
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<td>Multinational</td>
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<td>Organization Type</td>
<td>Private not-for-profit</td>
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<td>Form of Care</td>
<td>Primary care</td>
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<td>Secondary/tertiary care</td>
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<td>Eye Care</td>
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<td>Pediatrics</td>
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<td>Prevention</td>
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<td>Rehabilitative Care</td>
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<td>Electronic Health Records (eHealth)</td>
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<td>Managed Transportation and Logistic Services</td>
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<td>Innovation Type</td>
<td>Align with patients' locations and behaviors</td>
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<td></td>
<td>Right-skill the workforce</td>
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<td></td>
<td>Standardize operating procedures</td>
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<td>Website</td>
<td><a href="http://www.lvpei.org">www.lvpei.org</a></td>
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LV Prasad Eye Institute (LVPEI) provides comprehensive patient care, clinical research, sight enhancement and rehabilitation, community eye health, training and education, and product development services. The Institute originated as the vision of an Indian ophthalmologist wanting to provide excellent eye care to all segments of the Indian population. After building his career in the United States, Dr. Gullapalli N. Rao decided to return to India and in 1987 started an eye hospital to alleviate the blindness epidemic. Aware of the desperate need for eye care among the poor, he designed a system to provide high-quality care to all, regardless of the ability of the patient to pay.

LVPEI became one of the first few hospitals in India to provide Western levels of expertise, equipment, and instruments. The dual mission of providing state-of-the-art-care, while also reaching the indigent populations of rural communities, led to the creation of LVPEI’s Pyramid of Eye Care model. This model establishes infrastructure at all levels of care across urban, peri-urban, and rural communities. At the base of the pyramid, trained workers perform door-to-door visits to screen people for eye ailments. At the top, LVPEI provides the most complex eye surgeries, including corneal transplants. LVPEI has established world-class clinical quality and provides approximately 50% of its care for free while remaining self-sufficient using a systemic approach to efficiency that

(The Iron Triangle of Health Care)

Access

Quality

Cost

LVPEI established primary, secondary and tertiary care infrastructure across urban and rural communities and provides access to care regardless of ability to pay

The tertiary care centers generate experts in clinical care, while standardized processes establish and maintain high clinical quality

Standardization of processes, task shifting, and optimal use of personnel drive efficiencies that reduce costs

“Initially, when we started, we were not able to attract free patients because they believed there would be charges. It was a big challenge to get patients to come and get free services in the first 3 to 4 months. But now, there is not a problem with that.”

Dr Rohit Khanna, Associate Director
focuses on task shifting, standardization, and continuous improvement. LVPEI aims to not only improve eye health, but also instill health-seeking behavior in the larger society.

Originating as a single center in Hyderabad, the LVPEI network has grown into a large system covering many parts of the state of Andhra Pradesh. Since its founding 25 years ago, LVPEI has served over 15 million people and performed more than 600,000 surgeries across its primary, secondary and tertiary level eye care centers.

Providing Value to the Patient, Community, and Health System

2010 estimates by the WHO suggest that over 285 million individuals across the globe are visually impaired and over 39 million are blind. Data further suggests that 76% of the cases of visual impairment and 50% of cases of blindness are avoidable through preventative measures. Poor countries are disproportionately affected by the disease burdens created by blindness and visual impairment. With the second largest population in the world, India has a significant portion of the global blind (8.1 million) and accounts for over 20% of the visually impaired.

However, in the recent past, India faced a countrywide lack of equipment, ophthalmologists, and instruments that led to high rates of complications and prevented widespread adoption of modern surgery techniques. In the 1980s, for example, while phacoemulsification surgeries in developed countries had become common, the few cataract surgeries that were taking place in India were antiquated intracapsular cataract extractions. Furthermore, the cost of the surgeries was extremely prohibitive for the poor, who are most affected by visual impairment and blindness.

To address these needs, LVPEI developed the Pyramid of Eye Care model, establishing infrastructure at all levels of care, accessible to all segments of the population. The local primary care eye centers and community outreach staff provide access to care and improved awareness among patients. Furthermore, the social mission of the organization mandating free high-quality care for those unable to pay has removed the price barrier from care. The innovative features of LVPEI have resulted in a thriving model that has been able to successfully reach, create awareness, and treat populations across rural and urban communities, at all income-levels. In addition the model provides an alternative to government eye care options, decreasing the burden on overcrowded private and public providers at the secondary and tertiary level in Andhra Pradesh. LVPEI has also

“At the community level, we do screening for diabetes and hypertension and then we also screen the children and liaise them with other healthcare workers. We piloted this with one or two villages and found it quite useful. Unless you help people with the other issues they face, some of them are unwilling to come get help with the eye problem. They have backaches, sanitation issues, etc. If you help them with the other problems, then they trust you and will come for help with their eye care as well.”

Dr Rohit Khanna, Associate Director

LV Prasad Eye Institute

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directly or indirectly trained eye care workers for several providers in their service area.

Communities served by LVPEI experience improved access to health care services beyond eye care. LVPEI facilitates improved linkages between patients and health care providers. The institute houses a physician to help diagnose patients with chronic health issues such as diabetes, renal failure, and hypertension, and also screens patients in the community. LVPEI found that by diagnosing chronic health problems and linking patients with appropriate health care providers for their other health challenges, patients are more likely to seek needed eye care as well. LVPEI piloted this model in two villages and later with a larger population of 50,000 and found that it facilitated high patient throughput. LVPEI plans to apply lessons learned during this pilot to other geographic areas.

Health System and Policy Context

India has one of the most privatized healthcare systems in the world. While the majority of people in India choose to seek private healthcare options, which include state of the art medical facilities and world-class doctors, the high cost in most facilities limits access for lower-income populations. Public healthcare services are available in some areas with income-based subsidies and free services for the poorest households. However, public healthcare services remain unpopular, characterized by long waiting times, insufficient stock of free and subsidized pharmaceuticals, and more often than not, substandard facilities and care.

Healthcare services and healthcare workers are concentrated in urban areas, where financial return for private-sector providers is the highest. Approximately 700 million people in rural India lack access to basic healthcare and over half of the positions for doctors in rural hospitals remain unfilled due to doctors’ preference for urban areas.

High costs further restrict access to care. Healthcare expenditure in India is about 6% of the total GDP and approximately 80% of this spending is by the private sector. Chronic underfunding of healthcare expenditures by the government and the high cost associated with private healthcare options limit access to quality care, especially for the poor.
A lack of health insurance only further compounds the problem. Although some form of health protection is provided by the government and major private employers, health insurance schemes for the Indian public are generally basic, costly, and not widely available. Nearly all private sector health expenditures (98%) are paid out-of-pocket by patients. An estimated 20 million people in India fall below the poverty line every year due to health-related expenses. Recent public-private partnerships with insurance schemes are slowly increasing the availability and affordability of insurance.

The need for affordable care in underserved areas drives LVPEI’s model. LVPEI has also been able to take advantage of the relatively lower healthcare regulatory hurdles that exist in India, as compared to many developed nations. Governmental restrictions on infrastructure and personnel providing care are minimal and litigation is not as rampant. This allows LVPEI to use buildings that meet their internal clinical and quality requirements, while keeping capital expenditure low. It also allows them to efficiently designate tasks and responsibilities among staff to minimize cost while maintaining quality.

However, LVPEI faced some challenges inherent in the health ecosystem of India. At the beginning, it was difficult to attract patients who qualified for free services because of past experiences with the government health care system that used loopholes to impose unexpected fees. In time, LVPEI has overcome this challenge and demonstrated that the pyramid system, which is very similar to the government system, can increase access to health care for low-income populations. The organization has helped improve eye care programs in 18 states in India and 16 other countries.

LVPEI has also been active in training government doctors and is beginning to explore potential public-private partnerships. However, human resources and training continue to be the biggest challenge. There is a large variability in the quality of training programs in India, which at first created high demand for LVPEI’s fellowship program. Other providers, however, are also now offering training programs and the quality of education has increased, resulting in increased competition for human resources.

Operating Model
To address issues of access across geographies and income, LVPEI developed a Pyramid of Eye Care model designed to establish a permanent ladder of infrastructure across communities. Each level refers up to the next. At the base of the pyramid are Vision Guardians and community eye care workers, local
community residents trained at LVPEI to conduct community outreach through door-to-door visits for a population of roughly 5,000 individuals. They create awareness in the local communities about eye conditions, offer preventive care tips, and refer those with eye problems to the nearest primary or secondary level eye care center.

Vision Centers are the next level of care, typically small facilities located in rural towns and communities, designed to serve basic primary eye care needs for a catchment area of 50,000 people. These centers are managed by vision technicians with one year of post-high school training at LVPEI. The rapid growth of Vision Centers within the LVPEI model, now at 95 Vision Centers, plus 11 Secondary Centers, 3 Tertiary Centers and 1 Center of Excellence, speaks to their success in delivering care to rural and underserved populations in Andhra Pradesh.

The next level is Secondary Centers, eye clinics that handle the majority of complex eye issues and basic surgeries, serving a population of roughly 500,000. Staffed by 1 to 2 ophthalmologists and 10 to 12 paramedical and administrative personnel, Secondary Centers can diagnose all levels of eye disease and perform simple cataract surgery.

The top two levels are the Tertiary Centers and the Center of Excellence. The Tertiary Centers are located in cities and serve populations of approximately 5 million. These centers provide comprehensive eye services and training. The Center of Excellence at the top of the pyramid serves as a quaternary care center, dealing with highly specialized cases. Beyond clinical care, the Center of Excellence is also the hub for subspecialty training, research, product development, and advocacy at the local, national, and international levels.

The pyramid model is designed to produce high levels of efficiencies and task shifting optimization. The levels of care ensure that patients are treated by providers with level-specific training and that the most expensive human capital is used strategically. For example, surgeons are only responsible for surgeries (and not paperwork or patient prep), maximizing their throughput. To address workforce shortages, LVPEI established an education program for eye care
providers, training members of the local communities to work in their centers. As a teaching center, LVPEI has trained more than 14,000 eye care professionals, including all cadres of clinical, paramedical and non-clinical professionals.

LVPEI’s operating model is designed with the patient experience in mind. All aspects of the facility, including ambiance, patient flow, and cleanliness, are managed to create a place that does not feel like a hospital. The focus on standardization of processes is also critical to LVPEI’s operating model. It allows for best practices to be formalized and changes to be made in a systematic manner to ensure incremental improvements. These features continue to evolve through the Continuous Quality Improvement systems design at LVPEI.

Business Model

LVPEI generates revenue through a fee-for-service model, although patients who are unable to pay are provided care at no cost. Their business model leverages high patient volume and cross-subsidization to provide care regardless of ability to pay. This has created a virtuous cycle: offering free care to poor patients drives large volumes through the hospital, giving the ophthalmologists experience and establishing them as experts in clinical care. This expertise leads to high clinical quality and drives paying patients to the hospital and the fees collected from the paying patients subsidize the non-paying patients.

While there is not much difference in the skill level of surgeons performing the surgeries for the paying and non-paying patients, the peripheral features of care vary. Patients can pay extra for amenities in the waiting rooms, shorter wait times, a different type of lens implanted, and other such features. These variable services are tangentially related to the quality of care or eyesight outcomes, allowing those who are able to pay higher amounts for added peripheral services to generate revenue that subsidizes non-paying patients.

The establishment of infrastructure was accomplished through donations. However, the cross-subsidization model has allowed LVPEI to provide approximately half of its care for free and remain nearly operationally self-sufficient. LVPEI also generates revenue from hosting clinical trials for multinationals. While operating expenses are entirely covered by patient-generated revenue, grant funding allows LVPEI to also pursue clinical and public health research.
Impact Metrics

Quality metrics
- Use of quality control checklist
- Complications and their outcomes

Cost and sustainability metrics
- Percentage of services offered free of cost
- Number of eye donations received
- Number of providers trained (ophthalmologists, other eye care professionals, participants in CME and other programs)
- Number of presentations, publications, honors and awards.

Access and utilization metrics
- Number of outpatient visits and surgeries
- Number of outpatient visits and surgeries provided free of cost
- Number screened (programs and individuals)
- Number covered by door to door surveys (villages and individuals)
- Number of schools reached
- Percentage of total individuals reached who were children
- Number of eye programs upgraded in India and abroad

User satisfaction metrics
- User satisfaction survey

Achievement of positive health outcomes
- Sight enhancement client visits (low vision)
- Vision rehabilitation client visits
- Community based rehabilitation

Goals for Scaling and Replication

1. Establish and nurture the following centers over the next few decades:
   - Academy for Eye Care Education
   - Institute for Regenerative Ophthalmology
   - Child Sight Institute
   - Institute for Eye Care for the Elderly
   - Institute for Eye Cancer
   - Centre of Excellence in Eye Banking

2. Scale and replicate the primary and secondary care center network not only in India but also in other developing countries, especially African and South East Asian countries, through consultancy services, including clinical and managerial aspects)
3. Serve as the resource center for training and educational needs of all cadres of eye care providers and professionals, including clinical, managerial, and public health professionals required for a successful eye hospital as well as an eye care system

4. Build in-house management and administrative capacity to handle the expansion and develop the next generation of leaders in eye care (clinical and management), not only for LVPEI but also for its eye care partners located in India and abroad

External Support Required for Scaling and Replication

1. Mentoring and support from business leaders and the network
2. Technical assistance for employee recruitment, training, and retention
3. Sharing challenges and best practices with similar innovators
4. Access to potential funders (including corporations)

Selected Media Attention and Awards

Press


Awards

Council of Scientific and Industrial Research (CSIR). Shanti Swarup Bhatnagar Prize presented to four LVPEI ophthalmologists.


http://www.arvo.org/Awards_and_Grants/Awards/
ARVO_Awards_Recipients__Alphabetical/

*CNBC TV 18 India Healthcare Awards (2012). The Best Single Specialty Hospital, Ophthalmology.*

http://www.indiaprwire.com/pressrelease/health-care/20130220155899.htm

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L V Prasad Eye Institute provided the source data for this document and is responsible for the accuracy of the content