



# Driving down the cost of high-quality care

## Lessons from the Aravind Eye Care System

Aravind is delivering high-quality, low-cost ophthalmological care to some of India's poorest people. Its methods might help the health systems of developed countries.

**The Aravind Eye Care System** in Madurai, India, is the largest provider of ophthalmological services in the world. Although it performs almost 350,000 eye operations a year — 60 percent of them delivered at low or no cost — the quality of care it offers is excellent. Its surgical complication rate, for example, is lower than many Western hospitals achieve. Aravind's secret? Rigorous performance management, highly standardized care delivery, extremely high staff productivity, and a willingness to innovate in everything from how to source supplies to who can deliver services. Aravind therefore offers a number of useful insights for health systems and providers looking to improve the quality and cost-efficiency of care.

To learn more about the Aravind Eye Care System, which recently won both a Gates Award for Global Health and a Hilton Humanitarian Award, *Health International* spoke with Dr. Aravind Srinivasan, the organization's director of projects. He explained how Aravind has achieved such striking results and what lessons it could teach others.

**Health International:** *How was the Aravind Eye Care System started?*

**Dr. Srinivasan:** In 1976, Dr. Govindappa Venkataswamy, a man known to most of us simply as Dr. V, established an 11-bed hospital staffed by four doctors in Madurai, India, to provide care for patients with disabling cataract blindness. He named the hospital after one of India's most revered spiritual leaders, Sri Aurobindo.

Dr. V's vision was ambitious: to eliminate preventable blindness in India by providing high-quality, high-volume, compassionate eye care to all. The business model he established is deceptively simple. Aravind provides care

to those who can afford to pay market rates and then uses the profits to fund care for those who cannot. Each fully paying patient cross-subsidizes the care of three or four others. Patients who cannot afford to pay are given cataract surgery for free; however, the government reimburses Aravind \$10 for each procedure. We now have eight large hospitals and about 40 vision centers, and we have performed close to 4 million surgeries.

Over time, however, we realized that hospital care was not the only thing we wanted to do. We wanted to be self-sufficient, and so training and research have become very important to us. For example, at any given time we now hold classes to teach about 100 residents and fellows and approximately 300 technicians and administrators.

**Health International:** *How is India affected by poor eye health?*

**Dr. Srinivasan:** India is a fast-growing country with about 1.2 billion people; the GDP growth rate is now above that of most developed societies. Almost 40 percent of the population is upwardly mobile, but another segment of the society, about 50 percent, is not part of this growth cycle. These people live on wages equivalent to about \$1.50 a day. If they take time off work for doctor visits, they will not be able to feed their families.

Life expectancy in India today is about 65 years. But for people who lose half or more of their vision, life expectancy drops considerably; most of them will not live more than about another three years. Furthermore, the impact of vision loss goes beyond life expectancy; it lowers the productivity of the people affected and their communities.

## Aravind Srinivasan



### Education

Medical degree from the PSG Institute of Medical Sciences, Coimbatore, South India (1992)

Master's degree in ophthalmology from the Tamilnadu Dr. MGR University, Chennai, India (1996)

MBA in finance from the University of Michigan, Ann Arbor, Michigan (2000)

### Career highlights

#### Aravind Eye Care System

(2010—present)  
Director of projects

#### Aravind Eye Hospital

(2000—present)  
Administrator

#### Aravind Eye Hospital and PG Institute of Ophthalmology

Affiliated with the Tamilnadu Dr. MGR Medical University (2008—present)  
Professor of ophthalmology

#### Aravind Eye Hospital

(1996—1998)  
Medical officer

### Other professional accomplishments

Dr. Srinivasan also worked with the World Health Organization in 1996 and with Sight Savers in Nigeria in 1997.

It has been estimated that about 30 percent of the Indian population needs eye care, and about 80 percent of vision loss cases are preventable. Yet only about 20 percent of the people who need eye care have been given appropriate services. India has about 700 million mobile phones, but only about 29 million people are wearing glasses. We have a significant amount of work to do if we want to reach more people; we will be able to accomplish it only if we deliver care as cost-efficiently as possible.

**Health International:** *How does Aravind control costs?*

**Dr. Srinivasan:** As we all know, about 80 percent of eye health care costs are fixed; the variable cost component is only 20 percent. At Aravind, we realized that both types of costs had to be addressed forcefully if we wanted to make our business model work and use the

profits from fully paying patients to cross-subsidize care for others.

To address fixed costs, we decided that we had to maximize the use of our infrastructure and the productivity of our staff, especially our surgeons. Once we could do 200 to 300 surgeries per day, rather than 20 or 30, our fixed costs would drastically drop. In fact, we now perform more than 1,000 procedures each day across all our hospitals.

We have also aggressively pursued opportunities to lower variable costs. In the early 1990s, for example, we realized that intraocular lens manufacturers were not pricing for the Indian market, even though they had reduced the lenses' cost from \$100 to \$70. At that time, the average patient in India could afford to pay only about \$10 total for the lenses and the cataract surgery. We recognized that there was no other way to

solve this problem than to get into manufacturing ourselves, and so in 1992 we set up Aurolab, a nonprofit charitable trust that makes intraocular lenses and other ophthalmic consumables. Today, we estimate that Aurolab has a 7 percent share of the global intraocular lenses market, and our lenses are used in over 120 countries. Our lens pricing is now about \$2.

**Health International:** *Please tell us more about how you lowered your fixed costs.*

**Dr. Srinivasan:** To improve our fixed costs, we looked at the core of our business – patient-centric care – and explored ways through which we could make our processes more efficient. Believe it or not, our founder got his inspiration from McDonald’s, the fast-food chain. McDonald’s is very good at producing and delivering its products in the same way all over the world. It has been able to standardize food delivery using high-volume methods. A similar idea is at the core of Aravind’s management philosophy; we use it in our hospitals and other facilities (our eye camps and vision centers).

One good example is how we utilize our operating rooms. We have one surgeon in each room, but at least two operating tables and sometimes more. We also have multiple sets of equipment in each room and multiple nursing teams to carry out key nonsurgical tasks, such as preparing the patient and giving the anesthetic injections.

As a result, the surgeon can operate on one patient, swing the microscope across to the next table, and then start surgery on another patient. The tables are positioned to make this possible. Using this approach, our surgeons can perform six to eight procedures per hour – an average of about 2,000 operations each year (Exhibit 1). How many Western hospitals have achieved that rate of productivity?

Despite their high productivity, many of our doctors engage actively in research at our G. Venkataswamy Eye Research Institute. We encourage this because it helps them keep intellectually stimulated.

**Health International:** *You mentioned that nurses are allowed to give preoperative anesthetic injections. Is this also part of your effort to contain costs?*

**Dr. Srinivasan:** Our workforce is obviously another one of our major fixed costs. To lower workforce costs, we focus on letting doctors do what they are best at – diagnosis and surgery. We allow nurses to perform tasks in the operating room that do not require a surgeon’s skill. To further support our doctors, Aravind recruits several hundred women from local communities each year and gives them two years’ advanced training, after which they are certified as eye care technicians. These women make up 60 percent of our workforce, and they

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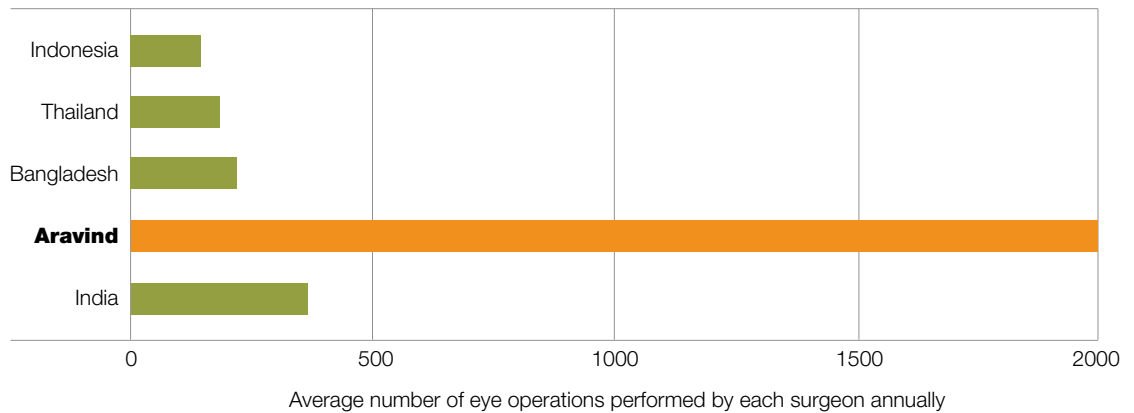
Exhibit 1

**Aravind’s approach markedly increases operating room utilization and surgeon productivity**

**Impact on operating room utilization**

	<b>Scenario A: One patient in the operating room at a time</b>	<b>Scenario B: Two patients in the operating room at any given time</b>
Surgeon	1	1
Tables	1	2
Scrub nurses	1	2
Instrument sets	1	6
Surgeries per hour	1	6-8

**Impact of Scenario B on surgeon productivity**



Source: Aravind Eye Care System

really are the backbone of the company. Because they perform many routine tasks, they free up our surgeons to operate at a high volume. And because of the standardized procedures we’ve set up, the quality of care the technicians deliver is quite high.

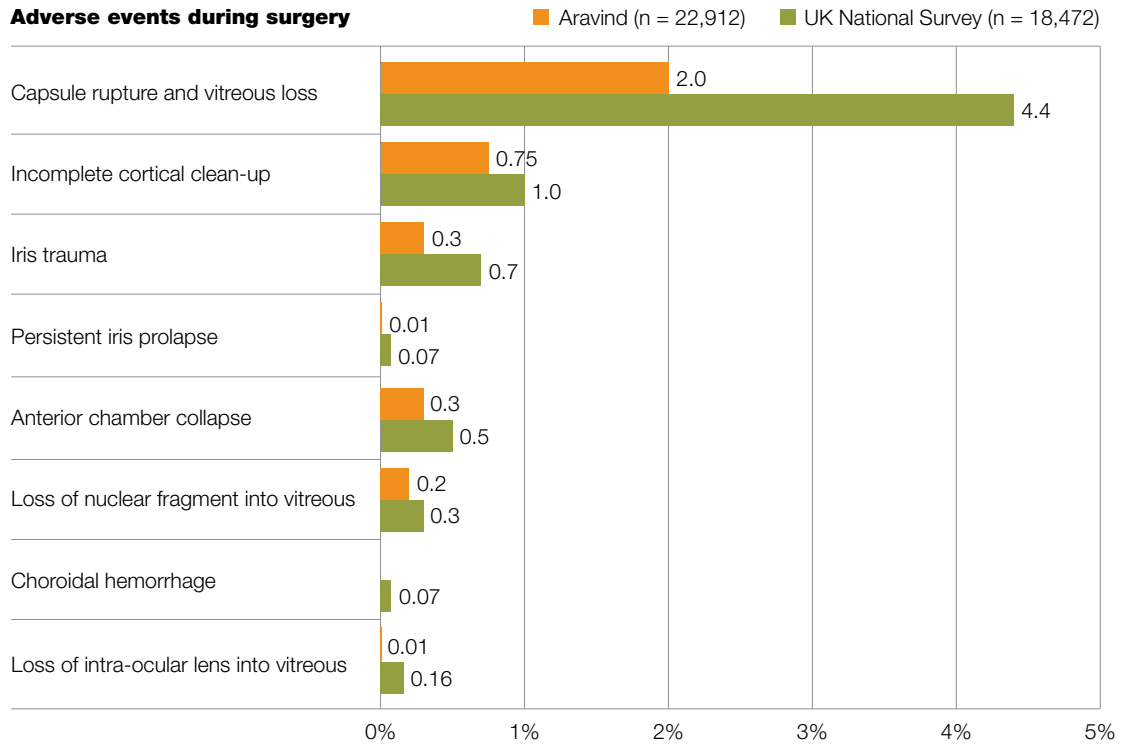
**Health International:** *Some of the practices you have described, such as having two patients in the operating room at once, may*

*strike some of our readers as dangerous. How can you be certain that quality of care has not suffered?*

**Dr. Srinivasan:** We routinely monitor clinical outcomes and complication rates to gauge overall care quality and spot when problems are arising. The results speak for themselves. Our surgical complication rates, for example, are half those reported in a national survey of UK

Exhibit 2

**Aravind’s complication rate is less than half that of UK hospitals**



Sources: Aravind Eye Care System; Royal College of Ophthalmology, Cataract Surgery Guidelines, February 2001

hospitals (Exhibit 2).<sup>1</sup> Aravind ensures that strict sterilization protocols are followed in all operating rooms. We also adhere to the guidelines prescribed by India’s accreditation body (the National Accreditation Board for Hospitals and Healthcare Providers, or NABH) and document all our processes diligently. Extensive documentation and intensive staff education have helped us keep infections and other complications to the lowest levels possible. This is a work in progress, though. We are learning every day how to better our services.

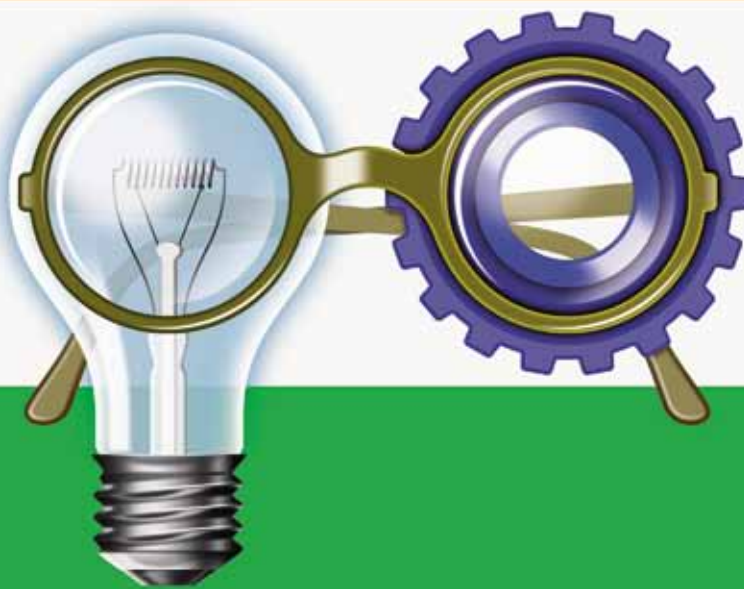
Our results have been published by Professor C.K. Prahalad in his book, *The Fortune at the Bottom of the Pyramid*.<sup>2</sup>

**Health International:** *How does Aravind ensure that its operating rooms are fully utilized?*

**Dr. Srinivasan:** Although the need for eye care in India is great, it can be challenging to ensure that we have high patient volumes at our hospitals. We realized that we had to go into the community and, in essence, create the demand for surgical care.

We began with an outreach program called eye camps — organized events held on weekends that often attract large numbers of people. Each eye camp provides care for 500 to 1,000 patients, who are given a basic eye exam, refraction,

<sup>1</sup> Royal College of Ophthalmology. Cataract surgery guidelines. February 2001.  
<sup>2</sup> Prahalad CK. *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits*. Saddle River, New Jersey: Pearson Education, Inc.; 2005.



tion test, and then a diagnosis. In most cases, the patient's problem can be corrected with eye glasses, but 10 to 20 percent of patients are found to need surgery.

Before the eye camps, the biggest barrier many people with vision loss faced was the time and effort required to seek treatment. They might be able to afford the \$2 for glasses, but not the cost of taking time off work to go to a neighboring town for a doctor's consultation and perhaps lose their job as a result. Not surprisingly, many people did not go for treatment.

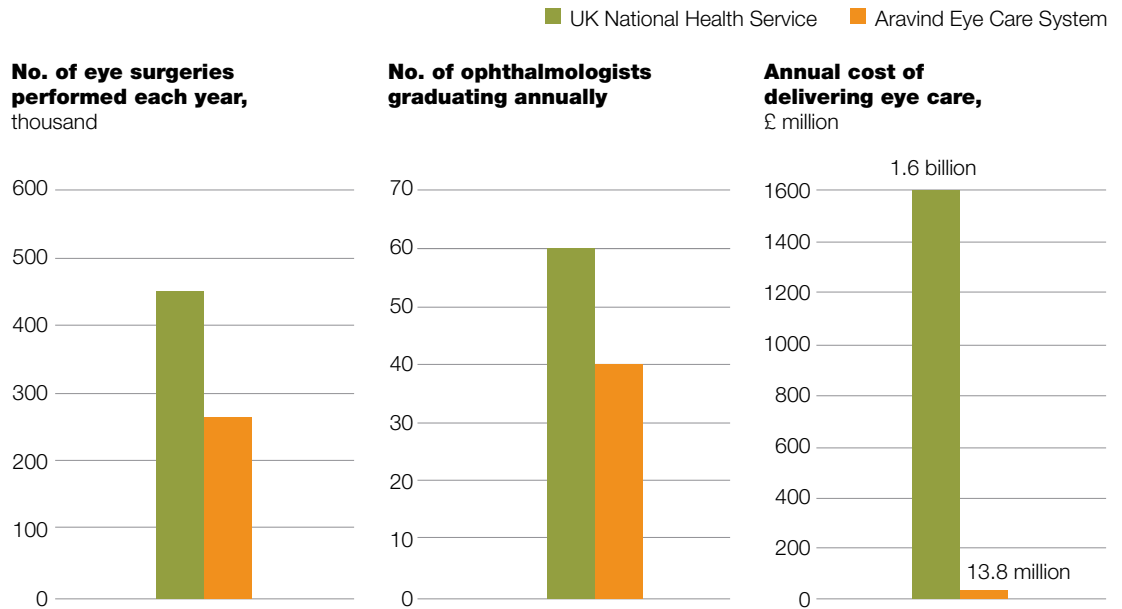
Our eye camps partially solve that problem. They take place in local communities. More than 90 percent of the people who are told

at the eye camps that they need glasses are able to obtain them at the camps, paying between \$2 and \$4. If the people require other types of treatment, we arrange to transport them to a hospital. The eye camps are not a complete success, however. We did a study about a decade ago because we wanted to understand how to improve the eye camps. We found that only 7 percent of the people who needed eye care took advantage of the camps, primarily because the events happened only sporadically, when Aravind or a sponsoring organization scheduled one, which was not necessarily when the patients needed help. Many eye diseases cannot wait six months for treatment. But in scheduling the camps as we did, we inadvertently sent a signal to sufferers that eye care can wait.



Exhibit 3

**Aravind’s economics are a fraction of those in developed countries**



Source: Aravind Eye Care System

We realized that we needed to handle eye care in the community somewhat differently, and so we have now set up about 40 local vision centers. Each center covers a population of about 50,000 people and is staffed by a family technician (one of the women we described earlier). Our technicians undergo training to enable them to conduct eye exams (including refraction tests) and to use grinding machines, handle lenses, and fit spectacles. The centers are connected to our base hospital via video conferencing so that each patient also gets advice from a qualified doctor. About 650 to 800 of these teleconferences are held each day. In addition, we use online health records to ensure quality of care. About 91 percent of the patients seen in the vision centers are able to get the care they need there.

**Health International:** *How successful has Aravind been?*

**Dr. Srinivasan:** Since its founding, Aravind has performed about 4 million surgeries. We are reaching parts of the population no one else is, and we are doing it in a very cost-effective way. For example, Aravind serves a population roughly equivalent to that of the United Kingdom (about 65 million people). The 350,000 operations we currently perform annually are approximately 59 percent of the number of eye surgeries undertaken by the UK’s National Health Service (NHS) each year. We also train about 71 percent of the number of ophthalmologists annually that the United Kingdom does. But our costs are substantially lower; we spend less than 1 percent of what the NHS does on eye care (Exhibit 3).

What are the reasons for this cost differential? Is it simply that the United Kingdom is not



## Fast facts about health care in India

### Health care spending

Estimates suggest that Indians spent about \$54 billion on health care in 2010, approximately 3.2 percent of the country's GDP.<sup>1</sup> Health care spending rose 24 percent between 2006 and 2010 and is expected to reach \$95 billion by 2014. Roughly 40 percent of the funds were spent on drugs and the remainder on service delivery. Private payments account for about three-quarters of the health care spending.<sup>2</sup>

### Health insurance

In 2010, only about 25 percent of India's population was covered by any form of health insurance.<sup>3</sup> By 2020, India hopes to expand insurance coverage to almost half the population, largely through government-sponsored programs focusing on those below the poverty line. However, rising income levels will also enable more Indians to afford private health insurance.

### Health care infrastructure

India has about 0.6 doctors trained in Western medicine and 1.3 nurses per 1,000 population.<sup>2</sup> The number of doctors per 1,000 population rises to 1.3 if registered practitioners of traditional Indian medicine are included. These numbers place India just slightly above the average for low-income countries (1.0 doctors and 1.3 nurses per 1,000 population). To meet global health standards, the country will need to train and retain 1.4 million more doctors and 2.8 million more nurses in the next few years.<sup>4</sup>

India has 0.9 hospital beds per 1,000 population, significantly above the average for other low-income countries

(0.2 beds per 1,000).<sup>2</sup> However, to meet the global average of 3.3 beds per 1,000 population, India will have to add 100,000 beds annually for the next 10 years.

At present, two-thirds of India's hospital beds are located in private facilities.<sup>4</sup> The dominance of private providers will continue for the near future; corporate chains and large private hospitals are adding beds at a rate that far exceeds the expansion of government hospitals.

### Health care as a driver of economic growth

India's GDP has risen by an average of 7 percent annually over the past 10 years, and health care companies have helped contribute to the country's economic growth. In the next decade, health care services in India are expected to increase at a compound annual rate of 12 percent to 15 percent, creating 70 million to 80 million new jobs in the process.<sup>4</sup>

### Public health metrics

Average life expectancy in India – 63 for men and 66 for women – is above the average for low-income countries (56 and 59, respectively) but far below the average for high-income countries (77 and 83, respectively).<sup>2</sup> India's maternal mortality rate – 450 per 100,000 live births – is also below the average for low-income countries but far above the average for high-income countries.

However, infectious diseases are no longer the leading cause of death in India. Noncommunicable diseases such as coronary heart disease now account for almost twice as many deaths each year.

<sup>1</sup> Data obtained from IMS Health and the World Health Organization; McKinsey analysis.

<sup>2</sup> World Health Statistics 2010.

<sup>3</sup> Ministry of Health reports; McKinsey analysis.

<sup>4</sup> Bakshi A et al. Gearing up for health care 3.0. A report prepared for the CII seventh India health summit. December 2010.

India, and wages are higher there? Wages, it turned out, are only part of the explanation. Aravind's greater efficiency in care delivery – its willingness to have more than one patient in the operating room and to permit non-doctors to deliver certain forms of care – plays a large role. Our willingness to drive down the cost

of supplies is also important. Not only do we manufacture our own intraocular lenses, but we re-use some types of equipment that in more developed countries might only be used once, because we have found evidence that the equipment is perfectly safe to re-use. Obviously, regulatory differences between India and more

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developed countries make it easier for us to implement some of these practices.

**Health International:** *What lessons have you learned that help explain Aravind’s success?*

**Dr. Srinivasan:** Perhaps the most important lesson we have learned is this: keep everything very simple. And keep everything close to mission so that people understand why we do what we do.

Second, we have also learned how important it is to have a strong value system — a value system we believe in passionately.


Third, we have realized that we have to keep a sharp focus on our delivery system. When Dr. V kept talking initially about McDonald’s, most of us didn’t get his point. But now that we have seen the impact of his approach, we understand his vision. Achieving scale and improving productivity has enabled us to keep costs down and treat hundreds of thousands of patients each year. It has allowed us to give back to society, to the communities.

Fourth, we have learned the value of innovation. In my experience, innovation does not come from abundance, it comes from scarcity. The large population we serve is spurring us to think innovatively and do things innovatively. Incidentally, we are keen to share what we have learned with others. We openly share our prices,

processes, and intellectual property to help others replicate our success. About 250 hospitals in India and around the world have adopted the Aravind model.

**Health International:** *What are your plans for the future?*

**Dr. Srinivasan:** There is still considerable unmet need for eye care in India. Thus, one of our goals is to move up from the 350,000 operations we currently perform each year to 1 million surgeries annually. We also feel that there will always be a need for high-quality, affordable products, and thus we plan to continue to expand Aurolab.

Despite the success we have achieved, we realize that a lot more remains to be done. We currently operate in only one part of India, and we would like to expand elsewhere in the country. We know that our work is cut out for us. But as our founder puts it: “It’s not the intelligence and capabilities that are going to help us overcome the challenge. There must be a joy of doing something beautiful.” 

**Tracey Vickers**, practice manager of McKinsey’s EMEA health systems and services practice, conducted the interview. **Ellen Rosen**, senior communications editor in the practice, assisted her.