

# The Doctor and the Favela

**One U.Va. physician's fight against the diseases of poverty**

Overhead, a homemade kite soars above squalor. Below, children are laughing, running across a field littered with trash. Nearby, a tall, slim, white-haired doctor is standing before a heap of crushed orange tile and concrete rubble. He was hoping to locate the family that lived here when this was a house.

He and his colleagues, a U.Va. medical student and a local nurse, are surrounded by children who have tagged along, as they do whenever visitors enter their neighborhood. One barefoot boy is able to confirm that the family did indeed live at that place, but he does not know where they moved.

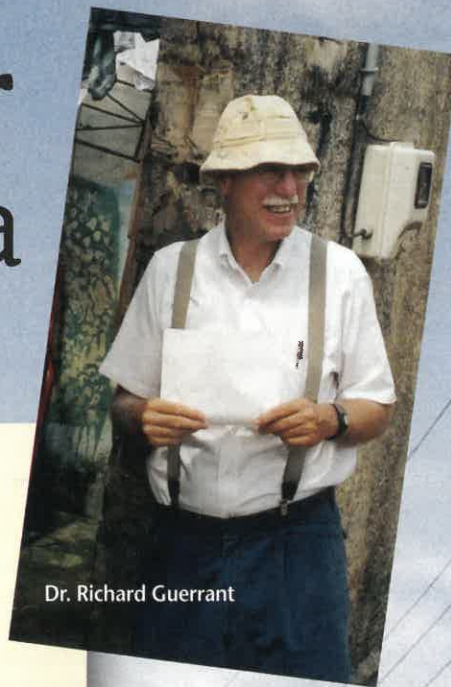
Years ago, the family had participated in a health study conducted by this man, Dr. Richard Guerrant (Med '68), director of U.Va.'s Center for Global Health. That study had outlasted the shattered house the family once called home. Guerrant is surveying hundreds of older kids and young adults who were sick with diarrhea as children. He is trying to determine the long-term effects of the disease.

The children live in a favela—an overpopulated slum—in Fortaleza, a city on Brazil's developing northeast coast. Guerrant has been treating and studying sick children here since 1978. When he started, the tallest building in the city was a seven-story beach hotel. Today, the city of 2.6 million has hundreds of high-rise hotels and apartments and office buildings. But beneath these shining buildings lay the shantytowns that house the more than 500,000 desperately poor people who have been bypassed by modernization. The poor here are concentrated in sprawling neighborhoods of cheaply constructed hovels. Most have come to the city from the rural interior looking for jobs, putting stress on an urban infrastructure unequipped to handle such a large and rapidly growing population. They migrate en masse during extended drought periods, and the droughts are occurring now.

Brazil is a country in transition. Good health and prosperity have come to many of its citizens, but about 6.5 million live without clean drinking water and flush toilets. Open sewers stream through the alleyways and streets of the poorest neighborhoods.

Because of high unemployment, the favela is sometimes a dangerous place, with drug and alcohol problems, drug dealing and violence. But there also is love: mothers hugging children, children hugging each other, close friends helping out where they can. They take pleasure from simple things: a meal, a hand-me-down dress or toy, a homemade kite of twigs and scraps of paper

STORY AND PHOTOGRAPHS BY FARISS SAMARRAI



Dr. Richard Guerrant



or plastic, a wild bunny as a pet. Adults and children flash the thumbs-up sign so often it seems as if nothing is wrong here, even as they stand barefoot on dirt streets in threadbare clothes.

Studies show that three out of four children in the favelas suffer from repeating bouts of debilitating diarrhea during their first two years—the very period when the children's minds and bodies are undergoing the most rapid and crucial developmental period of their lives. Some of these children die. Guerrant's investigations of the survivors—conducted in close collaboration with his colleagues at Brazil's Federal University of Ceará—show that a sick child of seven may be eight percent smaller than peers who were not routinely sick as very young children. And a young adult who was chronically sick with diarrhea as a child may have lost about 10 IQ points, the equivalent of a lost school year.

"Some people in the developed world may not think this matters very much," Guerrant says. "But when disease takes a slice of life and intellect out of a segment of society, it ultimately affects us all."

Guerrant's specialty is tropical medicine, the treatment of a huge variety of infectious diseases—cholera, dengue, yellow fever, typhoid, diphtheria and others—that originated in the tropics but can now be found the world over as humans travel fluidly across borders.

"Diseases of the poor can and do become diseases of the rich," he says. "Disease and poverty are whole-world problems uncontained by geographical borders."

Guerrant's biggest concern is not the occasional diarrhea that most people in the developed world are familiar with, but rather the "chronic, smoldering, terrible gut infections" that can hit a Third World child repeatedly during early childhood. Many of these children will be sick up to half of every month, and can lose up to 10 percent of their body weight. The child can be orally rehydrated with a sugar-water and salt concentration, but with each evacuation of the bowels, important micronutrients are flushed away rather than absorbed into the body. In a sense, the child's life drains down the sewers.



## **Empathy: The most important word in medicine**

Guerrant became concerned with the diseases of the poor when he was a medical student at U.Va. He got on a plane for the first time in 1967 and went to work at a mission hospital in the Congo. The experience changed his life forever.

"It was in Africa where I first learned that the most important word in medicine is empathy," he says.

He was shocked to see that so many people could be living every day in extreme poverty and misery. He realized that "perfectly preventable" infectious diseases caused most of their health problems. His purpose in life became clear: to ameliorate the diseases of the poor.

He didn't know it at the time, but the seeds were planted early for the global health center he would come to direct.

In the decades since, more than 150 U.Va. students and faculty have practiced medicine and conducted research in South America, Asia and Africa through Guerrant's international health initiatives. The Center for Global Health, inaugurated in 2001, unites and internationalizes U.Va. programs across the disciplines. Students from all fields are encouraged to develop creative uses of their talents for improving health worldwide. Guerrant's scholars include students from nursing, architecture, engineering, law, business, environmental sciences, government and public policy.

The center also brings international fellows from a variety of disciplines to U.Va. to study and share their knowledge and experience with faculty and students. Once they enter Guerrant's offices and labs, they find an international community of scholars eager to join forces in a global battle against disease.

Remarkably, all 65 of the international fellows who have come to U.Va. over the years have returned to their home countries to practice medicine, conduct research and influence policy.

"Any of these people could have found lucrative jobs in the U.S. and stayed here," Guerrant says. "But they have instead agreed with our philosophy of reversing the brain drain by returning home and improving the health of their own citizens."

One of these former fellows is Dr. Aldo Lima, director of the Institute for Biomedicine at the Federal University of Ceará. Lima came to U.Va. 18 years ago

Guerrant, Lima and their international team of colleagues are tracking hundreds of young children and adolescents in their studies and treating sick children with new vitamin-enhanced medicines developed in their labs. They are hoping to repair damage to the intestines caused by diarrhea to improve absorption of micronutrients. If the treatments succeed, these children may grow and develop normally despite their repeated exposure to disease. The National Institutes of Health and the Ellison Foundations fund the work. Over the years, the Rockefeller, Kellogg and Clark foundations have also supported Guerrant's projects.

Michael Timko, a U.Va. professor of biology, is looking for ways to genetically engineer essential nutrients into widely consumed Third World foods, such as bananas and cowpeas. If this cutting-edge research succeeds, children could ingest diarrhea-fighting vitamins simply by consuming their everyday foods.

Additional research is being conducted by Reinaldo Oriá, a pharmacologist who recently earned his Ph.D. under Lima while serving a two-year fellowship at U.Va. Oriá is putting together the puzzle that may someday explain which micronutrients are most important for normal brain development, and the best ways to deliver them. He hopes his answers will lead to new medicines that will put sick kids on track for healthier and more productive lives.

Like all the fellows before him, Oriá returned to his home country with a grant to continue the work he began at U.Va. He says the experience of working with an international team of researchers gave him a new perspective on the importance of his life's work.

"This center is about the universal idea that we are all human beings, wherever we are from, and that we hope for a better world together," he says. "The work to improve health and alleviate suffering must be done locally, nationally and internationally. I will keep these bonds."

#### Stepping into the favela

One of the earliest fellows to come to U.Va. from Brazil was Maria Auxiliadora de Souza, a professor of social medicine at the Federal University of Ceará. She introduced Guerrant and policy-makers in Brazil to the favela, having come from poverty herself. As an anthropologist and a physician, she immersed herself in Fortaleza's most desperate slums to



Most people in the favelas get their drinking water from community water tanks such as this one, provided by the city. This water, often limited in supply, becomes contaminated about half of the time during storage and handling.

understand how the people lived.

"I went to look and listen, to make a connection," she says.

At the time, the late 1970s and into the 1980s, only 20 percent of the people in the favela had running water and sanitation. Diarrhea was rampant. Children were malnourished with "more worms in their stomachs than food," she says. She found abject poverty; crumbling single-room huts with people "layered in hammocks;" no stove, only a fire on the dirt floor, the room full of smoke; and children with respiratory problems to accompany their gastrointestinal diseases.

"Many times I cried," she says.

The women and children begged for food on the streets. During meals a family would pass around a single plate and fork so each could eat in turn. The people believed they were sick because of *mal olhado*—that somebody had given them the evil eye. Most were illiterate.

De Souza attempted to educate the people herself, but, "You must show respect," she says. "You don't go into someone's house and tell them what to do."

#### Educating the government

The answer to these problems, she knew, was to fix the infrastructure, to bring health care to the people, to provide access to birth control, and educate the children. To do this, the government had to be educated. None of these changes could be accomplished quickly, and all of them required the support of policy-makers.

De Souza wrote a book about the favelas, graphically describing what she saw. Through her contacts at the universities, and eventually in the Brazilian government—some of them made through Guerrant's program—the problems of the poor were realized and understood. Slowly, the changes began to come.

"Auxiliadora is the reason we are able to enter the favelas to do our work," Guerrant says. "Everyone there is her friend. She laid the foundation by creating trust and understanding."

Much has improved in the shantytowns of Brazil. The biggest changes came between 1994 and 2002 when Anastácio de Queiroz Sousa, one of U.Va.'s former fellows, served as secretary of health for the large state of Ceará, where Fortaleza is located.

Using strong research to build his case, Sousa worked closely with other government officials to improve the water systems and health care in the favelas. When he first took office, only 30 percent of the people in Fortaleza's slums had sewer systems or chlorinated water. Today, 70 percent have sewers and cleaner water. As a result, the infant mortality rate has dropped from 8 percent to 2.5 percent—from 80 children dying at birth per 1,000 to 25. This is still considerably higher than the 6.8 deaths per 1,000 live births in the United States, but well below the infant mortality rate for all of Brazil, which stands at about 34 deaths per 1,000.

"In the past, people accepted infant mortality," Sousa says, "but not today."

This mind-set change occurred at the highest levels of government because researchers proved through years of high-quality data—much of it from Guerrant's and Lima's studies—that the costs of poverty were unacceptable to society as a whole.

"We helped the policy-makers to see the problems in a scientific way," Sousa says. This is "doing research where responses are needed, research for the benefit of the people."

#### Do the doable and persevere

Ben Beers, a second-year U.Va. medical student, stands in a favela with a clipboard in one hand, wiping sweat from his red face with the other. "The sun hurts," he says. "You can feel that it's closer." Indeed, Fortaleza is only three and a half degrees below the equator; the sun scorches the city all year long.

Beers is one of Guerrant's scholars, here for the summer, helping gather health information about children who are part of the team's long-term studies. He spends his mornings in the favelas visiting the women and children at their crowded little homes, conducting surveys, trying to keep straight who lives where, and if they've moved, how they can be found. In the afternoons, he's in the lab at the Institute of Biomedicine analyzing water taken from public faucets and homes in the favela. Though many improvements have come to the neighborhood, he finds that *E. coli* and intestinal parasites taint about half of the drinking water.

Beers lives in the favela with the family of Sayonara Sadio Bezerra de Alancar, a nurse who has been working with Lima and Guerrant for more than 20 years. Beers has developed a close friendship with Alancar, and in her neighborhood is a familiar sight—a tall, young American with a red ponytail and beard—walking with her and her

children, joking with them, holding discussions, learning about their culture and language. He is fluent in Spanish, and has learned "passable" Portuguese on the job by living with this family.

"The first word to learn in Portuguese is *obrigado*—thank you," he says, "The people here are always giving you something."

Beers is naturally inclined toward a life of service. At 29—years older than the average medical student—he has served two years in Honduras with the Peace Corps. He once worked for a year doing construction for Habitat for Humanity. He has taught elementary school and has worked as a ranger at Olympia National Park.

"I like working with communities and with people one on one," he says.

He wants to be a public health doctor, possibly in an underserved rural area like Southwest Virginia, perhaps in an urban setting like Washington, D.C., his hometown.

Beers is exactly the kind of compassionate medical student Guerrant is always seeking.

"My mission," Guerrant says, "is to tackle talent like Ben Beers and help him move in the direction toward which he is already inclined."

Beers learned the hard truth as a Peace Corps volunteer that complex problems are solved by working at them every day through any setback. "You have good days and bad months, but you have to believe that what you're going to do is going to happen," he says. "And good intentions are not enough—you have to do it right."

This ties in to what Guerrant is always telling his students and fellows: "You have to start somewhere. Figure out what you want to do, make a plan and make it happen."

Guerrant's newest dream is to form an international network of global health centers modeled on the work done at U.Va. This would link universities in the United States with colleagues worldwide, sharing people and resources, in efforts to make good the health of the poor.

It's a dream that started, in effect, on a mission years ago by a young medical student in the Congo.

"Start doing the doable and persevere," Guerrant says.

It is this philosophy that created U.Va.'s Center for Global Health—an idea that soars as hopefully as a homemade kite over a favela. **V**

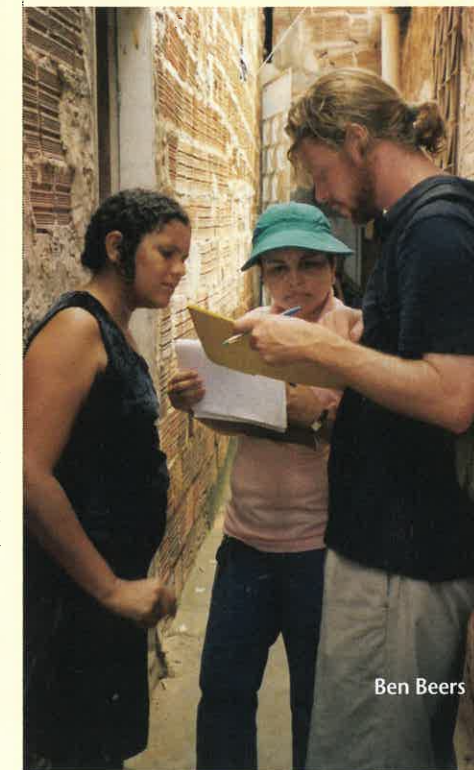


Left to right: Dr. Aldo Lima, Dr. Richard Guerrant, nurse Sayonara Sadio Bezerra de Alancar and U.Va. medical student Ben Beers discuss their research and survey strategies.

while earning his M.D. and Ph.D. in pharmacology. A framed picture of U.Va.'s Rotunda hangs in his office in Fortaleza. Lima is Guerrant's closest collaborator.

"He is like a brother to me," Guerrant says.

The two men and their wives have watched their children grow and have spent family vacations together. They share a fondness for classical and Brazilian music, food and wine, travel and adventure, and an inexhaustible passion for solving the problems of poverty. Across the hemispheres they work on joint grant proposals, research papers and articles for journals and medical texts.



Ben Beers