



INFANT MORTALITY

MALARIA

TUBERCULOSIS

EMERGENCIES

MEASLES

RESPIRATORY DISEASES

## Across the border

*Global health professor Usha Ramakrishnan wondered whether omega-3 fatty acids, such as the ones found in some fish, could enhance infant growth and development as well as prevent post-partum depression in mothers. With Emory colleagues and collaborators at the Instituto Nacional de Salud Publica (INSP) in Cuernavaca, Mexico, she created a study to answer her questions. The research tracks the mental and physical health of 1,000 Mexican women who take omega-3 fatty acids during pregnancy and the growth and development of their children.*



This study and others in infectious disease and environmental health in Mexico are part of the Partners in Global Health Program, an ongoing collaboration between Emory and INSP. With funding from Emory's Global

Health Institute (GHI), the partners are strengthening their ties through more student-faculty collaborations and an increase in interdisciplinary research across Emory.

For example, Reynaldo Martorell, Woodruff Professor and chair of the Hubert Department of Global Health, led a student exchange to INSP last spring. Known as the Compañeros Project, the exchange derives from the word "partners" in

Spanish and was conceived of by students Kristin King and Maureen McDonald in the Rollins School of Public Health. "We wanted to start a dialogue between students and investigators that could lead to thesis or even career opportunities down the road," says King.

The Compañeros Project offers students an opportunity to learn about the public health system of another country intimately connected to and affected by their own, says Martorell. "The students were most impressed with the community approach to public health that Mexico is putting in place as well as the country's preparation for emergencies and outbreaks, such as flu pandemics." In return, students from INSP came to Emory last October to discuss how to make the exchange program sustainable through grants and other funding.

In a related project, the International Association of National Public Health Institutes (IANPHI) at Emory will support a proposal from national public health institutes in Mexico, Costa Rica, and Panama to assess public health infrastructures in eight Central American countries. In turn, Mexican partners have committed in-kind contributions and will take a leading role in technical assistance. Once infrastructures are assessed, the GHI expects that individual country projects, improved regional collaboration, and sharing of resources will follow. —Robin Tricoles





## Deadly combo

*It's not everyday that WHO classifies a new disease, but it recently has done just that with the co-infection of HIV and tuberculosis.*

Approximately one-third of the world's 40 million people with HIV/AIDS also are infected with TB. Of those, 90% die within months of contracting TB if they are not properly and promptly treated. To compound the problem, finding effective treatments is growing more difficult as various strains of TB are becoming more drug resistant throughout the world.

The Global Health Institute is approaching the challenge from two directions: vaccines and better diagnostic tests. Rafi Ahmed, director of the Emory Vaccine Center and a Georgia Research Alliance Eminent Scholar, is leading research on the interplay between HIV and TB at the cellular level in India to find a cost-effective vaccine to prevent HIV/TB. In Africa, Emory infectious disease expert Henry Blumberg is studying the accuracy of new diagnostic tests for TB in people likewise infected with HIV/AIDS.

The first collaboration brings together Emory scientists and one of India's premier research centers to improve the control of infectious diseases worldwide. Located in New Delhi, the International Center for Genetic Engineering and Biotechnology (ICGEB) is providing state-of-the-art laboratory space for the partners. These groups have formed a new Center for Global Vaccines, where they are concentrating on diseases that disproportionately affect vulnerable populations in developing countries. They already have made significant progress researching vaccines for malaria, hepatitis C and E, tuberculosis, and HIV, as well as HIV/TB co-infection, according to Ahmed.

"In terms of sheer numbers, India now has the largest number of HIV-infected people in the world, and 5.7 million of them have the HIV/TB co-infection," says Ahmed. "The majority of people infected with HIV also have TB, which is endemic in India. Most people get primary TB as children. The majority of them will live a healthy life and die of old age. But when they get infected with HIV on top of the existing TB, their immune

systems become compromised, and the TB reactivates."

A vaccine exists to prevent TB but is effective only in limited circumstances. Emory and ICGEB want to develop a vaccine that can be used more widely and given to those who already have TB.

The collaboration in Zambia shifts the focus to a new generation of diagnostic tests for TB called interferon gamma release assays (IGRAs). In concert with Emory's medical and public health schools, University Teaching Hospital in Lusaka, and the University of Zambia School of Medicine, researchers will evaluate the effectiveness of IGRAs for diagnosing the latent form of TB among people who have HIV.

Although people with latent TB are infected with the organism that causes the active form of the disease, they often don't feel sick, have no symptoms, and are unable to spread TB to others. However, those with latent TB are at risk for progressing to active TB, and HIV co-infection is the greatest risk factor for that progression. Treatment of latent TB, therefore, can markedly reduce this risk. People with active TB show symptoms and can spread the disease through coughing and sneezing.

Historically, countries hard hit by TB and AIDS/HIV have lacked resources in diagnosing and treating latent TB. Instead they have struggled to insure adequate infrastructure for treatment of active TB. However, in high-risk patients, WHO now recommends treatment of the latent form of the disease with the aim of reducing this deadly combo.

The Zambia-Emory Research Initiative builds on work established by the Zambian-Emory HIV Research Program and founded by Susan Allen in the Rollins School of Public Health. For the latest studies, scientists will have access to the largest, longest-standing cohort of discordant couples in the world. Discordant couples include one person with HIV/AIDS and one without. The researchers will be able to compare the effectiveness of these new diagnostic tests for TB in both HIV-positive and HIV-negative partners. They also will be able to test the accuracy of the new tests compared with the older tuberculin skin test, in use for nearly a century and limited by its rate of false negative and false positive results. —RT

## Dancing diabetes away

*Venkat Narayan was on call and unable to sleep the night he made his way to the hospital's medical library. Unsuspecting and bleary-eyed, he was about to find a book that literally would change his life. That was more than 20 years ago, and the book was Fletcher's Clinical Epidemiology.*

"When I read that book, I fell in love with the possibility of medical inquiry coupled with the concept of broad public health," says the Emory professor of medicine and the Ruth and O.C. Hubert Professor of Global Health. "In medical

school, there was a lot of emphasis on memorizing facts, not on asking 'how do you know.' From then on, I began shifting my interest from clinical medicine to epidemiology and diabetes."

Narayan's inquiries have led him to South Asia, the locale he believes is the

best place to begin research and intervention aimed at controlling diabetes worldwide. In India alone, it is estimated that 40 million people suffer from diabetes, and, by 2030, that number will reach 80 million. The people of India, Pakistan, Bangladesh, and Sri Lanka are all at high risk of developing diabetes, according to Narayan, a native of Bangalore.

"These populations have a high risk of putting on fat, very low lean muscle mass, and insulin resistance, all critical risk factors for developing diabetes," says Narayan. "With South Asia's population of nearly 1.5 billion people, 4,800 distinct ethnic groups, and more than 500 tribes, it is the logical place to see if researchers can learn more about diabetes."

Curiously, diabetes is not new to India. Textbooks dating back 3,000 years describe the disease in detail. At least 25 Sanskrit words were used to describe it. "When a language like that has 25 words for a disease, it must have been a big problem," Narayan says.

And it still is, with a rapid and relentless emergence of diabetes in South Asia today. Concerned with the explosive growth of diabetes, Emory's Global Health Institute, along with the Madras Diabetes Research Foundation (MDRF), has established the Global Diabetes Research Center in Chennai, India, which Narayan will lead with V. Mohan of MDRF.

The center will focus on interdisciplinary research and interventions throughout South Asia and other parts of the world. It also will provide innovative educational and research opportunities for Emory faculty and students. Narayan sees the effort as a long-term partnership that will emphasize cultural compatibility and low-cost solutions to prevent and treat diabetes.

MDRF already has years of data on 160,000 South Asian diabetics. Their information will serve as the foundation for several new collaborative studies, including one focusing on the growing prevalence of diabetes in rural southern India. "Rural cohorts are exciting to study because diabetes is just beginning to emerge in rural areas with growing prosperity," says Narayan.

Other studies are examining nutritional intervention during pregnancy to reduce the risk of childhood diabetes and early cardiovascular disease, the effect of diabetes on brain function, and the disease's effect on immune memory and response. Likewise, interventions involving exercise (shown to be an important way to help prevent and reduce diabetes) will take into account cultural norms, sustainability, and affordability.

For example, one intervention will study whether indigenous exercise such as yoga and regional dances may reduce obesity and in turn diabetes. The study will investigate whether this effort will spread through a community via local fitness instructors, both paid and volunteer.

For Narayan and his collaborators, such interventions are the first steps on a long road to curtail the explosion of diabetes and obesity in one of the world's largest populations. But as the optimistic researcher says, it is a good beginning. "Besides," he adds, "how do you know something will work unless you try." —RT







## AIDS out of Africa

*Kate Winskell had no idea that a series of short films about HIV/AIDS would catch on. More than a decade ago—before the predominance of the Internet—she was searching for innovative ways to reduce the spread of HIV/AIDS among young Africans. The old ways of trying to stop the spread of the disease—programs that dwelled on medical facts while ignoring behavioral aspects or educational films that were long, had inaccessible language, and were culturally out of tune—were clearly limited.*

So Winskell, a visiting professor in the Rollins School of Public Health, decided to launch a new kind of communications program with colleagues to prevent HIV/AIDS. Scenarios from Africa began in three French-speaking countries in West Africa: Senegal, Mali, and Burkina Faso. The films took off, being adapted for use in other countries, with people queuing up to be a part of the project. “We had no idea that these films would be used at the other end of the continent,” says Winskell, who learned that Television Trust for the Environment in London had distributed the films to colleagues in Namibia and dubbed them into six Namibian languages. Since those simple beginnings, Scenarios has snowballed, and it now extends to most of sub-Saharan Africa.

Working with hundreds of community organizations in Africa, the organizers invite young people to develop ideas for short films to educate their communities about HIV/AIDS. Top African directors transform the winning ideas (selected by juries of young people, people living with HIV, and specialists in HIV prevention) into short fiction films.

The films are donated to television broadcasters across Africa, dubbed into local languages, and used as discussion tools in communities to educate people. So far, more than 105,000 people from 37 countries, ranging in age from 5 to 24, have taken part in these contests, and Scenarios has produced 33 films. The films have been broadcast on more than 100 television stations in or serving Africa.

A focus only on the audiovisual component of the program, however, falls short of its full impact. “The program is so much more than that,” says Winskell. “It’s a very rich



process about community development, empowering young people to address the epidemic on their own terms, and local organizations having an opportunity to learn from one another and the young people they are serving.”

The contest also motivates young people to search for information in their communities about HIV/AIDS. That may mean visits to local centers or seeking the advice of older siblings. The process allows them to enjoy “the protective cover of fiction,” says Winskell. “It enables them to ask about hypothetical situations that may be related to what they’re experiencing themselves.”

Likewise, the project gives those who are HIV positive an opportunity to be part of a life-affirming project. People living with HIV are often mentors, and they work with the young people to develop scripts. “They don’t need to reveal their HIV/AIDS status, but it’s very empowering for them to be involved in those educational efforts,” Winskell says.

To support the educational efforts of Scenarios, the Global Health Institute is sponsoring three of the project’s team members as visiting scholars at Emory. The first to arrive, Benjamin Mbakwem, founded an AIDS prevention organization in Nigeria for young people to learn small-business management skills and develop HIV prevention tools. At Emory, he has begun to analyze the enormous archive of scripts on HIV/AIDS written by young people during the past 10 years, and he’ll also be a guest lecturer. Classmates here will get a first-hand lesson from a Scenarios veteran on how to help rid Africa of AIDS. —RT

## Not if, but when

*Endemic to southeast Asia, avian flu has been steadily spreading throughout the world, from South Korea to Turkey to Romania, with the latest outbreak occurring just last summer in Indonesia. Of the 106 cases confirmed there, 85 proved fatal.*

As Chinglai Yang sees it, when it comes to preparing for an outbreak of avian flu, the question is how long do we have.

The Emory microbiologist and immunologist says a virulent form of avian flu, such as the H5N1 strain, could cause a pandemic rivaling or even surpassing the pandemic of 1918, which left 20 million dead. What's more, estimates of the 1918 flu strain put fatalities at 5%, whereas today WHO estimates the H5N1 strain to have a fatality rate of 60%.

H5N1's virulence lies in its newness: we would have little if any immunity to it, says Yang. Even a relatively tame pandemic could sicken or kill enough people—healthy ones, too—to cause serious, long-term consequences. Hospitals would be over-burdened,

transportation slowed, and necessities in short supply.

Spurred on by these possibilities, Yang has led an effort to establish an international consortium on avian flu control. It includes a Center of Excellence for Influenza Research and Surveillance (CEIRS) at Emory and the Harbin Veterinary Research Institute (HVRI) in China. The consortium's goal is to develop a universal vaccine against different H5N1 avian influenza strains.

Because CEIRS and HVRI focus on complementary research areas, we can better prepare for a possible avian flu pandemic, Yang says. Emory will work on the molecular virology and immunology components, whereas HVRI will direct its efforts toward avian flu surveillance and the pathogenesis of the disease.

As part of the ongoing collaboration, Emory is training visiting HVRI scientists, while HVRI will provide training to Emory researchers in field surveillance and viral pathogenesis studies.

"Avian flu is an extremely dangerous virus," says Yang, "but the more we start to know about it, the better prepared we will be when it arrives." —RT

## Drug discovery in South Africa

*"To effectively battle neglected infectious diseases of poverty, the transfer of money and technology is not enough," says Dennis Liotta. "It is expertise in the discovery and development of new medicines that is the intrinsic requirement."*

Liotta should know. Working with Emory colleagues, the professor of chemistry has produced several new drugs, including an anti-HIV drug used in the majority of AIDS cocktails today.

To help spread Emory's expertise where it is most needed, the university has launched the South Africa Drug Discovery Training Program. African scientists will train at Emory, working with researchers throughout the Emory campus. They will gain hands-on experience in translating research into health care solutions and subsequently return to their home countries to receive placement in industrial or academic positions. The visiting scholars—six to start—will initially come from South Africa, but scientists from all over sub-Saharan Africa will soon take part in the training.

"By helping shift early-stage drug discovery to South Africa,

this initiative will foster a viable research infrastructure capable of responding to global health care needs," says Liotta. "The fact that several small pharmaceutical companies are beginning to spring up in Africa makes this an ideal time to develop a drug discovery training program."

Liotta and colleagues recently formed iThemba, a start-up biotech company based in South Africa. By developing scientific, economic, and educational alliances with African scientists, industry, and universities, iThemba's goal is to develop affordable drugs to fight the diseases of poverty.

"We believe that we can develop affordable, effective drugs using a combination of relatively low operating costs and socially conscious investments," says Liotta. "This is crucial because, for the most part, there is little incentive for pharmaceutical companies to invest in new medicines to treat diseases that have relatively small markets."

Support for the South Africa Drug Discovery Training Program is coming from both the South African government and the Emory Global Health Institute. —RT



## No accidental tourist

*Lynn Sibley will never forget the small wooden coffins for sale in the Bolivian marketplace that she frequented. Perched on top of buses alongside other market goods, the plain boxes were intended to hold the many newborns and infants who died there.*

The year was 1980, and the then-pregnant Sibley was visiting Bolivia as a tourist. In everyday life, she was a registered nurse who was considering leaving the nursing profession. But after seeing the coffins, she changed her mind.

"I decided instead to figure out how to get involved and somehow make things better," says the associate professor of nursing at the Nell Hodgson Woodruff School of Nursing.

Sibley (second from right in photo) returned to the United States and gave birth in her home to a healthy son. Fifteen months later, she enrolled in graduate studies in nurse-midwifery at the University of Colorado. She later completed a doctorate in anthropology, a background she believes enhances her understanding of global health and culture. Since then, Sibley has worked with colleagues from the American College of Nurse-Midwives (ACNM) on a program that teaches health care workers in developing countries simple steps that increase the chances of survival of mothers and newborns.

WHO estimates that a woman dies every minute from causes related to pregnancy and birth, making childbirth the leading cause of death and disability for women of reproductive age. Women living in the poorest countries are most at risk. That is why the ACNM takes their program to developing countries such as India and Belize.

With support from Emory's Global Health Institute and the International Center for Diarrheal Disease Research, Sibley is now implementing a similar program in Bangladesh. Home-Based Life Saving Skills equips women and traditional birth attendants, such as family and neighbors, with basic lifesaving techniques they can use without expensive tools and technology. First tested in India, the program has worked so well that now it is taught in six countries: Haiti, Liberia, Afghanistan, and Ghana, in addition to Bangladesh.

There, Sibley and her collaborators are concentrating on pro-



longed labor and birth asphyxia in newborns. Asphyxiation is the leading cause of infant mortality, according to Sibley, occurring when the baby gets inadequate oxygen in utero because of placental rupture, trauma, or prolonged labor.

"We're trying to teach birth attendants how to monitor labor and determine what is considered a normal duration," says Sibley. "That includes recognizing the signs of prolonged labor and knowing how to intervene, if necessary. At the same time, we want to respect the local cultural norms and beliefs."

For example, although hemorrhaging is the leading cause of maternal death globally, some cultures believe that postpartum bleeding is nature's way of cleansing the body after birth. While putting together a training program for birth attendants in India, Sibley was mindful of balancing this cultural norm and others with the health and well-being of the mother by teaching birth attendants to recognize when bleeding becomes life-threatening and the appropriate intervention to take.

Sibley circles back to her experience in Bolivia when she talks about what has become her life's work. "Life and death were so visible there. And death clearly came so early for so many. It made me think a lot about life, death risks, and how people in different places adapt to circumstances. It made me acutely aware of my own privileged existence. Yet, at the same time, I became aware of a kind of poverty in how we sanitize so much in our culture, including death. In any event, it became clear that I could not be a tourist anymore." —Robin Tricoles is a science writer in the Emory Health Sciences Communications office. ●