

EMORY

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Rollins School of Public Health



Mother and Child | SPECIAL ISSUE

# Growing Up Healthy

PROTECTING MOTHERS  
AND BABIES FROM  
PESTICIDES

ENSURING THE  
ROTAVIRUS VACCINE  
WORKS BETTER

SMALL NUTRIENTS,  
BIG IMPACT

**On the cover** Kathleen Presswala plays with her son Calvin at a park near her Atlanta home. Presswala is a writer in the Office of Development and External Relations at Rollins.

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## ▲ Protecting our children

Ensuring the health of children from conception to adulthood is of prime importance to researchers at Rollins. According to the most recent World Health Organization estimates, 6.6 million children under the age of 5 died in 2012. More than half of these deaths were caused by conditions that are preventable and treatable. In 2008, Bolivian children like those shown above began receiving the rotavirus vaccine to prevent severe diarrhea. Juan Leon, Rollins assistant professor of global health, believes that combatting malnutrition may be the key to improving the vaccine's effectiveness. Read more about his work on page 18.



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James W. Curran, MD, MPH  
*James W. Curran Dean of Public Health*

## One very special population

Children are special, particularly when it comes to their health. They respond differently from adults to environment, disease, and medicine. For example, children may be more vulnerable to the harmful effects of air pollutants. They breathe in more air (relative to their body size) and have greater metabolic requirements for their immune systems.

Our aim at Rollins is to promote the health of infants and children through research to bring about policy change. But doing so doesn't begin with looking at how environmental factors or nutrition—two of the many facets that Rollins faculty study—affect infants and toddlers. Ensuring children's health begins with the health of their mothers, long before they become pregnant.

One of the first researchers to call attention to the consequences of maternal and child health is Reynaldo Martorell, whose recent studies examine the lifelong effects of famine on children in China. Famine is rare today, but women of reproductive age in the developing world continue to be undernourished from a lack of micronutrients. Martorell's colleague, Usha Ramakrishnan, calls attention to this troubling problem through her work in India and Vietnam. You can learn more about their work in this issue and that of other faculty, including Dana Boyd Barr's efforts to protect pregnant women from pesticide exposure in Thailand, Saad Omer's advocacy that vaccine compliance also include expectant mothers, and Juan Leon's commitment to protecting babies in Bolivia from a rotavirus infection that causes severe diarrhea.

In August, the world watched as an Emory Healthcare team successfully treated the first two patients with the Ebola virus in our nation. I am proud of Emory for caring for these patients and changing attitudes about treating and containing this disease. Thousands of experts with the CDC and other agencies and the U.S. military are working together to stem the Ebola epidemic in West Africa. These courageous people are working under difficult conditions to save thousands of lives. They exemplify public health practice at its very best.

## Moving toward a new treatment for Parkinson's disease

**Scientists who study Parkinson's disease know well that the loss of dopamine-producing cells in the brain is a key trait of this disorder and leads to impaired physical movement.** They have long suspected that dopamine itself may contribute to the death of these neurons.

Gary Miller, Asa Griggs Candler Professor of Environmental Health and associate dean for research at Rollins, previously demonstrated that all-important dopamine becomes a liability when improperly stored inside brain cells. Now his research team has turned that liability into an asset. In a recent study, Miller's laboratory found that it is possible to enhance the storage of dopamine, which could lead to improved treatments for Parkinson's.

Dopamine and other neurotransmitters are stored in small packages called vesicles, which are controlled by a protein called vesicular monoamine transporter, or VMAT2. When dopamine is released from these vesicles, it helps regulate physical movement and emotional responses.

Using mice genetically engineered with an extra

VMAT2 protein, Miller's team showed that more dopamine is released, leading to a remarkable increase in movement and a decrease in anxiety and depressive behaviors. Not only did the mice store more dopamine in their brains, they also released more of it when needed.

They also were resistant to a classical toxin used to study Parkinson's.

Miller's team is now focusing on identifying drugs that could exploit these findings to help treat the estimated 8 to 10 million people globally who have Parkinson's disease.

"Our work suggested that enhanced dopamine storage can be sustained over time and may be a viable therapeutic approach for a variety

of central nervous system disorders that involve the storage and release of dopamine, serotonin, or norepinephrine," says Miller. "Parkinson's disease is the obvious place to start." ■

*Results from Miller's study were published in the July 8, 2014, edition of Proceedings of the National Academy of Sciences (PNAS). Learn more about his study at [bit.ly/PNAS-dopamine](http://bit.ly/PNAS-dopamine).*



### A Growing Legacy

*A recent \$10 million gift from The O. Wayne Rollins Foundation will double the O. Wayne and Grace Crum Rollins Endowment Fund at the Rollins School of Public Health. Established in 1997, this unrestricted endowment provides support for the school's highest priorities, including recruiting and retaining key faculty leaders. The Rollins family's commitment to public health has enabled the school to build the Grace Crum Rollins and Claudia Nance Rollins buildings. Emory President James Wagner (left) and RSPH Dean James Curran recently met with members of the Rollins family to thank them for their exceptional generosity. They include Gary Rollins (center), Amy Rollins Kreisler, and Randall Rollins.*





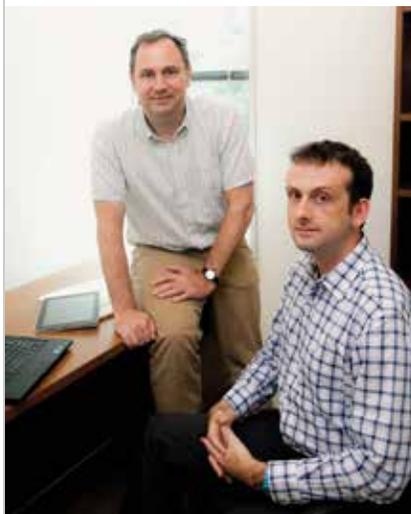
## *Vitamin D and cancer*

Vitamin D may lower the risk of developing hepatocellular carcinoma (HCC), the most common type of liver cancer. A study led by Veronika Fedirko, assistant professor of epidemiology, found that higher levels of vitamin D lowered the risk of HCC by 49%. Her study included 138 Western European subjects who developed HCC between 1992 and 2010.

“Despite evidence that vitamin D supports liver health, the association between vitamin D levels and HCC had not been fully examined,” says Fedirko. “There is steadily growing scientific evidence that low-circulating vitamin D concentration is a marker of increased risk for various cancers, particularly colorectal cancer.” ■



## New app connects men to prevention and testing services for HIV



**Epidemiologist Patrick Sullivan (left) and global health expert Rob Stephenson are developing a new HIV prevention mobile app for men having sex with men (MSM).**

Slated for testing in Atlanta and Seattle this fall, the app allows users to receive personalized recommendations based on questions they answer and a list of sites near them for testing and/or counseling. It also enables them to schedule test appointments and access other services from community HIV/AIDS organizations or public health departments.

The largest increase in newly diagnosed cases of HIV infection is among young men aged 18 to 29 years, and a mobile app fits well with this technology-savvy age group, says Sullivan.

“We will never replace counseling services with an app, but we can help men find the testing services that work best for them,” he says. “This app just facilitates the right engagement. It leads you to services and even gives you driving, transit, or walking directions, and that helps to eliminate barriers to accessing health care. In this age we are in, we cannot accept a situation where people cannot have easy access to testing. The app is a scalable resource that works together with other resources offered by community organizations and public health departments.”

A grant from the MAC AIDS Fund helped Sullivan and his research team to conduct focus groups of MSM of all ages and work with public health departments and community organizations to integrate their services into the app. Sullivan and Stephenson plan to make the app available to more cities. ■

## A window to health for Mexicans in the Southeast



The RSPH and the Consulate General of Mexico in Atlanta have begun a new program to promote health among Mexican nationals in Georgia, Alabama, and Tennessee.

**In Georgia, people of Mexican origin comprise two-thirds of the Latino population.** The majority of Mexicans who live in the region are working adults aged 20 to 40. Because they are young, most have yet to develop the chronic conditions that plague older adults.

Keeping the young Mexican population healthy is at the heart of a new partnership involving the RSPH and the Consulate General of Mexico in Atlanta. Rollins faculty, staff, and students are providing consulate visitors with health education and linking them to health services through a program called *Ventanilla de Salud* (VdS), or Window to Health.

The program has a large audience. On average, more than 1,000 people visit the consulate each week to renew passports and other personal documents. The consulate's mobile unit reaches an additional 1,000 people weekly as it travels to towns in Georgia, Alabama, and Tennessee. The region comprises one of the largest Mexican Consulate jurisdictions in the United States.

This summer, four students from Rollins, the Nell Hodgson Woodruff School of Nursing, and the National Institute of Public Health in Mexico completed practicum experiences at the consulate in Atlanta to provide health education and referrals for clinical services and sources for

health insurance. All worked with VdS program coordinator Brianna Keefe-Oates 13MPH to develop a survey to capture data on consulate visitors. Other students will assist with the survey during this academic year.

"It's a big job," says Karen Andes, VdS director and assistant professor of global health. "We want to collect data to describe this population in comparison with major health surveys in the United States and Mexico."

Results from the VdS survey will be used to compare rates for chronic conditions such as diabetes and cardiovascular disease with other Mexican populations.

The survey also will help determine what proportion of Mexican nationals and their families have access to health insurance by immigration status. As Andes notes, gathering health information on undocumented populations is difficult, in part because people come and go and prefer to stay under the radar regarding their status.

VdS builds on the success of the Latino Health Summit held two years ago at Rollins. Sponsored by the Hispanic Health Coalition of Georgia, the summit marked the release of the 2012 *Georgia Latino Health Report*, prepared by Andes and a team of Rollins students that included Keefe-Oates. The report, funded by the Healthcare Georgia Foundation, documented the health status of Georgia Hispanics based on publicly available data. Health data generated by the VdS survey will help expand health reporting to other states in the Southeast.

Andes plans to involve other Emory partners in VdS, including the School of Nursing, which leads a successful program to provide basic health care to migrant farm workers in Moultrie, Georgia, each summer.

"I see VdS as a tremendous opportunity to bring students in the health sciences together to strengthen our capacity to work with the Latino population throughout the Southeastern U.S.," she says. ■



## *A new role for Khan*

**Ali Khan OOMPH is the new dean** of the University of Nebraska Medical Center College of Public Health, founded in 2007. For the past 23 years, Khan served at the CDC, most recently as director of its Office of Public Health Preparedness and Response. At Rollins, he served as adjunct professor of epidemiology and president of the RSPH Alumni Board. In 2011, the alumni association honored him with its Distinguished Achievement Award for his many accomplishments, including teaching and mentoring students at Rollins. ■

The National Science Foundation awarded the RSPH a five-year, \$2.5 million grant to develop new computing tools for simulating the impact of climate change on water quality and waterborne disease.

“This type of disease causes millions of deaths each year, mostly among children, and more than 2 billion people in tropical and subtropical regions have limited access to clean water and adequate sanitation,” says Justin Remais, associate professor of environmental health and principal investigator of the project. “To reduce the global burden of waterborne disease, we need to find sustainable solutions to water supply and quality problems that result from climate change.”

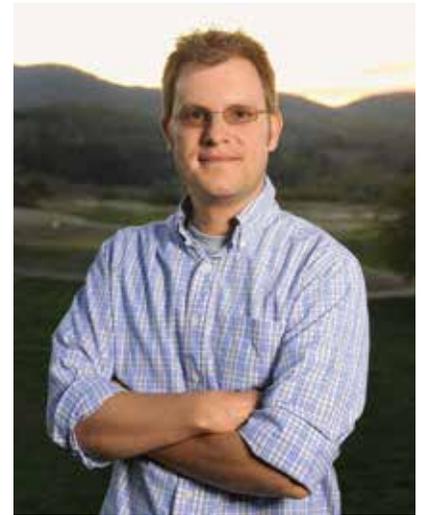
Remais’ research team will develop computational models of surface water quality and waterborne disease risk that account for the complex relationships between meteorological phenomena and pathogen growth, survival, and transport using test sites in western China and northern Ecuador. The team also will examine how climate

**“To reduce the global burden of waterborne disease, we need to find sustainable solutions to water supply and quality problems that result from climate change.”**

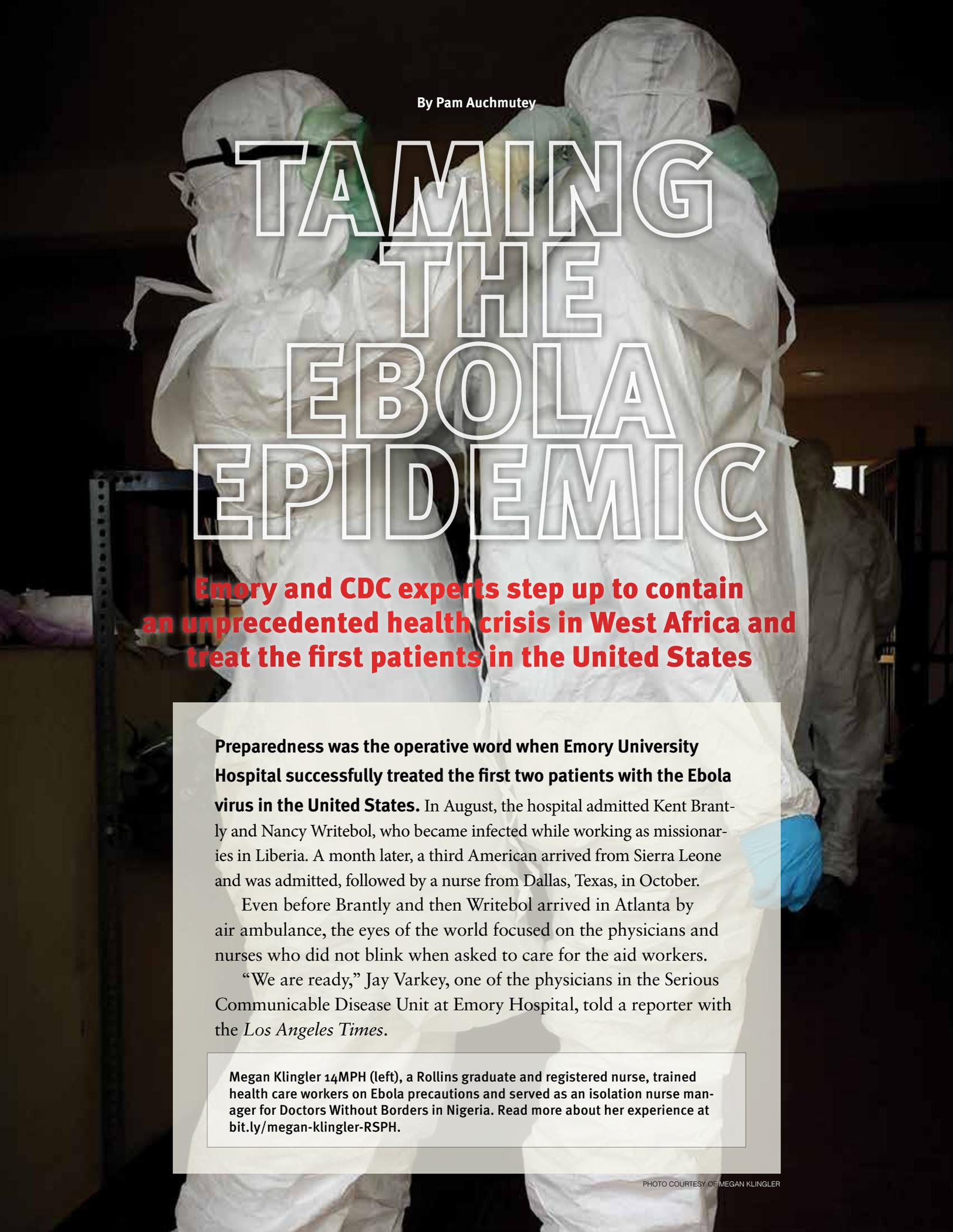
change can affect disease transmission by, for instance, altering water flow in streams and rivers or changing pathogen transport in waterways.

Pathogens in lakes, rivers, and streams are known to be sensitive to climate change, but researchers have been challenged to make reliable predictions about the effects of future environmental change on water-related infectious disease. Future climate conditions in some tropical and subtropical regions are expected to disrupt water quality and supply, but interventions such as improved agricultural practices and more targeted sanitation provision could limit climate-related changes in disease.

“Our study aims to identify policies that reduce water-quality problems under future climate conditions and limit disease risk,” says Remais. His project team includes earth scientists, environmental engineers, mathematical modelers, social scientists, and epidemiologists from Emory, the University of Florida, Georgia Institute of Technology, Trinity College, and the University of Michigan. ■



Justin Remais’s team will conduct testing in China and Ecuador to study the ties between weather and water quality and how they may affect growth and transmission of waterborne diseases.



By Pam Auchmutey

# TAMING THE EBOLA EPIDEMIC

**Emory and CDC experts step up to contain an unprecedented health crisis in West Africa and treat the first patients in the United States**

**Preparedness was the operative word when Emory University Hospital successfully treated the first two patients with the Ebola virus in the United States.** In August, the hospital admitted Kent Brantly and Nancy Writebol, who became infected while working as missionaries in Liberia. A month later, a third American arrived from Sierra Leone and was admitted, followed by a nurse from Dallas, Texas, in October.

Even before Brantly and then Writebol arrived in Atlanta by air ambulance, the eyes of the world focused on the physicians and nurses who did not blink when asked to care for the aid workers.

“We are ready,” Jay Varkey, one of the physicians in the Serious Communicable Disease Unit at Emory Hospital, told a reporter with the *Los Angeles Times*.

Megan Klingler 14MPH (left), a Rollins graduate and registered nurse, trained health care workers on Ebola precautions and served as an isolation nurse manager for Doctors Without Borders in Nigeria. Read more about her experience at [bit.ly/megan-klingler-RSPH](http://bit.ly/megan-klingler-RSPH).



Rollins graduate Lisandro Torre works in the CDC's Emergency Operations Center to estimate the number and cost of medical supplies needed for the Ebola outbreak.

Bruce Ribner, the physician in charge of the unit, responded without hesitation when approached about treating Brantly, who worked for Samaritan's Purse in Liberia. "We've been practicing for this for 12 years," Ribner told the U.S. State Department.

The Ebola patients in the isolation unit received round-the-clock supportive care to maintain vital functions to enable the body's immune system to fight the virus and recover. As Ribner's team quickly learned, replacing fluids and electrolytes lost primarily through vomiting and diarrhea was key to their patients' recovery.

"We depend on the patient's body defenses to control the virus," Ribner explains. "We have to keep the patient alive long enough for the body to control the infection."

In preparation for their first patients, Emory physicians and nurses practiced donning and doffing

the protective suits, gloves, booties, and hoods required to keep them safe while working in the isolation unit. Sean Kaufman, a biosafety expert and former faculty member at the RSPH, coached team members

the O. Wayne Rollins Foundation.

"We made sure everything was by the book," says Kaufman, who observed the Emory team's patient interactions from the anteroom in the isolation unit.



VIDEO STILL COURTESY OF WXIA

### The battle in West Africa

The same strict protocol holds true for public health experts deployed by the CDC and other agencies to contain the virus in West Africa. "That requires old-fashioned public health practices—identification, isolation, contact tracing, more isolation, and watching contacts for symptoms,"

says Jeffrey Koplan, vice president for global health at Emory and former director of the CDC. "You can't miss anybody—85% is not enough, 'most' is not enough."

More than 20 outbreaks of Ebola hemorrhagic fever have occurred in Africa since 1976, when the disease was first detected near the Ebola River in the Democratic Republic of Congo

on how to suit up and remained on hand to ensure they followed procedures, including when the staff had to contain a small spill of contaminated fluids.

Kaufman has taught biosafety all over the world and led training programs for Rollins' Center for Public Health Preparedness and Research, established after 9/11 with a gift from

(then called Zaire) and Sudan. Most outbreaks have been relatively small until now. The latest outbreak, centered in Guinea, Liberia, and Sierra Leone in West Africa, began in December 2013 and was first detected in southern Guinea in March 2014.

That same month, the CDC's Pierre Rollin left for Guinea a few days after giving a lecture in Carlos del Rio's course on International Infectious Diseases at the RSPH. Rollin is regarded as the world's leading expert on viral hemorrhagic fevers like Ebola.

"Clearly, RSPH students have heard from the very best in the field about this topic," says del Rio, Hubert Professor and chair of the Hubert Department of Global Health.

During two deployments to Guinea, Rollin led CDC efforts to collect and manage data, follow up confirmed cases, provide health communication and information, and train physicians and health workers in collaboration with the nation's Ministry of Health. The challenges proved daunting.

"People and officials in Guinea were very afraid because it was the first time that Ebola struck in West Africa, and they had a lot of questions about the disease and transmission," Rollin says. "They are now better informed, though some still don't believe that this is a disease."

"Obviously, you cannot fix everything in the middle of the outbreak," he adds. "People's behaviors and responses to disease are influenced by their traditions, and that is very difficult to change. I've learned to work with religious leaders to try to influence the population."

Back in the United States, Emory physicians advised that doctors in hospitals and emergency rooms

worldwide be ready to recognize Ebola virus infection and isolate patients if necessary. And while the physicians noted that concerns about the virus spreading beyond West Africa to Europe and North America were valid, they emphasized that Ebola was transmitted only through direct contact with bodily fluids (not through the air like influenza) and that highly developed hospital infection control practices would contain the virus.

"The main lesson we have learned from the current Ebola outbreak is that we can no longer ignore global disparities in health care resources," says del Rio, who co-wrote an article about the epidemic with Aneesh Mehta and Marshall Lyon, physicians on the isolation unit at Emory Hospital, and Emory pathologist Jeannette Guarner for the *Annals of Internal Medicine*. "The affected countries have some of the most dire health care infrastructures with a paucity of health care providers. The other lesson is that sound public health, engagement with affected

communities, and international solidarity are needed to control this outbreak."

Since the number of Ebola cases escalated in early August, more than 850 CDC staff members have been called on to work in the agency's Emergency Operations Center (EOC). An additional 100 CDC experts are being deployed for weeks at a time to West Africa, along with members of the U.S. military pledged by President Obama during his visit to the CDC in September. CDC epidemiologist Jeffrey Ratto, MPH worked with the District Health Management Team in Port Loko, Sierra Leone, to conduct surveillance, including tracking cases and contacts of cases.

"There are many challenges to containing the Ebola outbreak in Sierra Leone," Ratto wrote while stationed in the country. "Community belief has a huge impact on our control efforts. As long as people don't believe in the disease or don't change their behavior, the surveillance efforts won't stop it. A single unsafe funeral can infect many people and start a



PHOTO COURTESY OF THE CDC

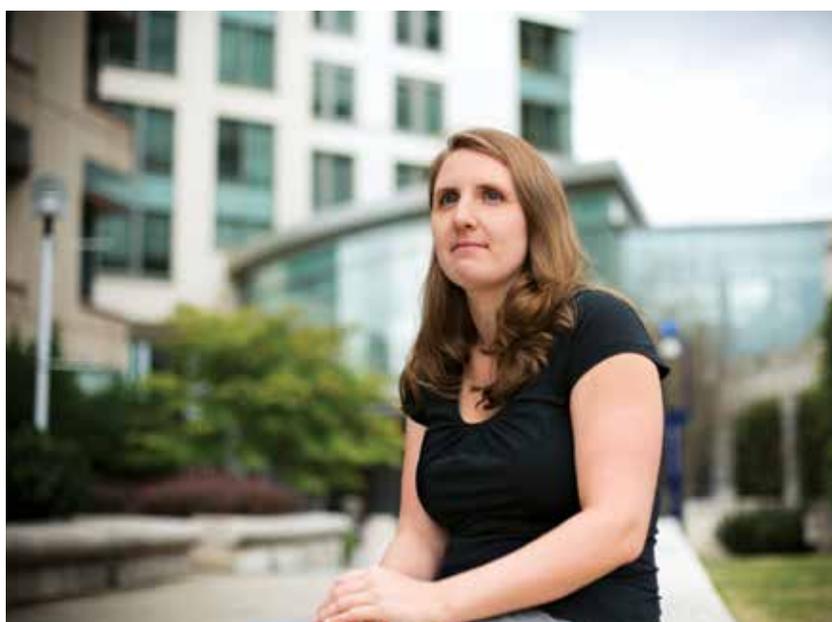
Health education remains one of the biggest challenges in stopping the Ebola epidemic. Here, Red Cross volunteers go door to door in Guinea to share information about preventing the virus.

transmission chain in the community that goes through multiple people. Traditional practices in conducting funerals have persisted throughout the outbreak.”

At the CDC in Atlanta, Lisandro Torre MPH works in the EOC with the Medical Supply Task Force to provide estimates for the number and cost of supplies needed to combat the outbreak. Supplies range from hospital beds and facilities to personal protection equipment for health care workers. Like his colleagues, Torre sees West Africa’s poor health infrastructure as the greatest challenge in combatting the disease.

“The shortage of health facilities and trained health care providers makes it difficult to reach the level of infection control needed to curb the outbreak,” he says. “We are simultaneously combatting the disease and trying to assist governments in building up their infrastructure. There has been some progress, but the undertaking is so large that the progress made seems to be overtaken by the disease. Our goal is to reverse that.

“I’m doing a lot of things in this response that I would not have expected coming out of Rollins,” he continues. “Everyone I’ve met during the response has been willing to do anything to push the mission forward, regardless of what their job title says they’re supposed to be



“The response to Ebola permeates into the Rollins community because of our proximity to the CDC,” says Mary Claire Worrell, an MPH student in the Complex Humanitarian Emergencies Certificate Program.

doing. You need to make yourself match the needs and not wait for the role you think you fit in.”

### Science and compassion

Mary Claire Worrell, a second-year student in global epidemiology at Rollins, first learned of the Ebola outbreak last March through emails posted on the website ProMED.

Her interests in infectious disease and emergency response led her to enroll last year in the Complex Humanitarian Emergencies Certificate Program offered through the Center for Humanitarian Emergencies (CHE) at Rollins. The center, a collaborative effort of the school and the Emergency Response and Recovery Branch at the CDC, also provides an annual fellowship to a student from a conflict-affected country and supports practicum experiences for students in the certificate program.

This year, CHE director Dabney

Evans MPH has added teaching and research to the center’s activities. Several MPH students are helping her teach an undergraduate course on complex humanitarian emergencies. Additionally, a CHE research team comprised of 17 MPH students is working on a variety of projects related to humanitarian emergencies in various countries.

In her CHE courses, Worrell

listens to lectures by experts at the CDC, including Mark Anderson, acting chief of the Emergency Response and Recovery Branch. Anderson has taught classes at Rollins for nearly a decade, and his branch provides funding support for the CHE. Last year, Anderson helped orchestrate responses to humanitarian crises in Syria, Ethiopia, South Sudan, and the Central African Republic. In recent months, he has worked in the EOC to assist with the Ebola outbreak.

“That’s the great thing about our CHE courses,” says Worrell. “They are taught by people who know everything because they work on the ground. It’s an amazing opportunity. The response to Ebola permeates into the Rollins community because of our proximity to the CDC.”

Next spring, Pierre Rollin will lecture again in Carlos del Rio’s course on International Infectious Diseases. He’ll have much to share about the Ebola

## Mapping the Way

### SORT students aid Ebola response in West Africa

**One of the main challenges in responding to the Ebola epidemic in West Africa is difficulty in finding people who live in remote areas.** Existing maps pinpointing the location of villages, houses, buildings, ponds, paths, and roads are either out of date or do not exist at all. The Student Outbreak and Response Team (SORT) at Rollins, which partners with the CDC and others to provide



taught them how to use an online mapping platform called OpenStreetMap to gather spatial data, particularly in Guinea, Sierra Leone, and Liberia. Students use a base map generated by aerial satellite imagery and proceed to identify villages, houses, buildings, and other details based on that imagery. A system of checks and balances is in place to ensure that the new detailed map is accurate.

“It’s like the Wikipedia of mapping,” says Anna Tate, a second-year MPH student and communications chair with SORT. “OpenStreetMap allows volunteers to provide more detailed maps to organizations on the ground like Doctors Without Borders that are spearheading the Ebola response.”

Tate is also a fellow in the CDC’s Office of Public Health Preparedness and Response. The Ebola outbreak afforded her the opportunity to be part of high-level meetings in the Emergency Operations Center and to update CDC statistics on the number of Ebola cases and deaths in each African country. She publishes the new numbers online every few days, based on the latest statistics from the World Health Organization.

Her current work on Ebola is a fitting extension of her interest in viral hemorrhagic fevers. The subject captivated her in high school when she read *The Hot Zone: A Terrifying True Story*, the 1994 bestseller about the origins of such diseases.

“I feel very fortunate to work on the Ebola response at the CDC and with SORT,” says Tate. “I had no idea I would be involved in such an unprecedented international outbreak response. It’s a rare and incredibly rewarding opportunity.”—*Pam Auchmutey*

hands-on training and experience in outbreak response and emergency preparedness, is helping remedy that.

SORT members, 45 in all, are part of a global volunteer army helping map small squares of land throughout the affected West African region in more detail. All it takes is a computer, an Internet connection, and a couple of hours of training led by Ryan Lash, a geographer in the Division of Global Migration and Quarantine in the Travelers’ Health Branch at the CDC.

In August, as the number of Ebola cases surged, Lash contacted SORT to ask the students for help. He

epidemic, which experts predict will last for several more months and possibly cause up to 1 million cases in West Africa. What might he tell students then?

“The most important thing is to realize that you always have something to learn,” writes Rollin

from Guinea. “Common sense and compassion are the best tools when you don’t know something. Science is important. But being a good public health practitioner includes a little bit of anthropology, communication skills, practical skills, and a lot of humility.” ■

📺 *Learn more about the Ebola epidemic in the article co-written by Carlos del Rio for the **Annals of Internal Medicine** at [bit.ly/Ebola-annals](http://bit.ly/Ebola-annals). The website also includes a video of del Rio discussing the topic.*

Mother and Child | SPECIAL ISSUE

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# Growing Up Healthy

“Children are our future, and their mothers are its guardians,” said Kofi Annan while serving as United Nations secretary-general. Spurred by U.N. Millennium Development Goal No. 4 to reduce childhood mortality by two-thirds as of 2015, the number of deaths of children under age 5 has declined—from 12.6 million in 1990 to 6.6 million in 2012. **Rollins researchers are among those improving the odds globally for children and their mothers.**

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Stories by Kay Torrance and Pam Auchmutey



# Protecting mothers and babies from pesticides

## ASSESSING THE RISKIEST TRIMESTER OF PREGNANCY

### TOPS IN CITATIONS

**Dana Boyd Barr** is among the more than 3,000 researchers cited by the media and information firm Thomson Reuters on its list of “Highly Cited Researchers 2014.” These researchers wrote the greatest number of highly cited papers in 21 fields during the past decade. In addition to Barr, the list includes six other researchers in various fields at Emory.

**EACH MORNING, MILLIONS OF WOMEN ACROSS THAILAND TREK TO WORK AT ONE OF THE COUNTRY'S MANY FARMS.** Before they head out to start a long day of picking fruits and vegetables, they wrap cloth around their faces to help avoid breathing in pesticides sprayed on farms to protect crops.

Half of the country's job force works in agriculture and routinely are exposed to toxic, environmentally persistent, and cheap chemicals used extensively throughout Thailand and other developing countries. While pesticides help protect crops, they also put farm workers and the estimated 400,000 babies born yearly to women who work in agriculture at risk for serious health problems.

The country does have laws governing pesticide use, but its enforcement of them is lax, says Dana Boyd Barr, research professor of environmental health at Rollins.

“Thailand's policies governing the use of pesticides are very broken,” she says. “Four different ministries in Thailand make the rules governing pesticide use.”

Haphazard governance and lack of personal protection gear put pregnant women at risk, Barr says. By studying the issue, she wants to pinpoint when

pesticide exposure is most harmful to a baby's development during pregnancy.

“There are about 80,000 pesticides out there worldwide, and very few of them have been studied for exposure in humans or for long-term exposure,” she says. “I want to try to understand what parents, and moms in particular, can do during pregnancy to attenuate negative outcomes. If we can't eliminate exposure, then we should do everything we can to lessen exposure.”

Barr's research team recently completed a pilot study in Thailand in which they found that pesticide exposure in a woman's second trimester increased the risk of impaired motor development in babies. A first-trimester exposure likely affected a baby's reflex development.

An analytical chemist by training, Barr also has been involved in the four largest studies in the world looking at organophosphate pesticide exposure in children. The studies, from 1998 to 2003, looked at organophosphate pesticide (common insecticides) exposure among children, from in utero to age 7 in California, New York, and Ohio. Collectively, the four studies found that children had a higher risk of de-



Dana Boyd Barr seeks to understand what parents, and mothers in particular, can do during pregnancy to eliminate the negative health effects of pesticide exposure on unborn babies in Thailand and other countries.

**“Thailand’s policies governing the use of pesticides are very broken. Four different ministries in Thailand make the rules governing pesticide use.” — DANA BOYD BARR**



layed development, attention deficit hyperactivity disorder, and an IQ deficit that was twice the level observed in children with lead poisoning.

“There are some gaps in pesticide exposure research, but on the other side is industry,” Barr says. “Pesticides are a big moneymaker for companies, and often the regulatory agency is caught in the middle. Sometimes we need more complete research. It’s an ever-changing field. As one class of pesticides fades, another one comes into play. Often, when you find out one pesticide’s use

patterns and identify the population that is affected, industry may have moved on to another product.”

Barr, who built a two-decade career at the CDC before joining Rollins four years ago, hopes that the Environmental Protection Agency will change its policy regarding use of organophosphate pesticide to better protect pregnant women.

“We at Rollins are not just doing research to do research,” she says. “We are doing research to translate into policy to ensure that the future for our mothers and children will be better.”—*Kay Torrance*



# Spreading the message about vaccine compliance

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COVERAGE SHOULD BEGIN DURING PREGNANCY

**NEW PARENTS-TO-BE SEE AND HEAR A HOST OF MESSAGES GEARED TOWARD THEM. BREASTFEEDING IS BEST. REAR-FACING, NOT**

**FRONT-FACING, CAR SEATS ARE SAFER FOR NEWBORNS.** Babies should sleep on their backs. What parents aren't hearing enough, says RSPH researcher Saad Omer, is that pregnant women and their babies need vaccines so that both stay healthy.

"When you start talking about childhood vaccines with parents after their babies are born, it is already too late," he says. "Young parents are more receptive when they are pregnant. There are already lots of messages that are targeted to them during pregnancy, such as breastfeeding and safety. We need to add mother and child vaccinations to that."

He wants pregnant women to know that vaccinations given during pregnancy also help protect their babies. He was the first researcher to document that babies born during flu season (October 1 to May 31) and whose mothers were vaccinated during pregnancy were less likely to be premature or small for their gestational age than babies born to unvaccinated mothers. Another of his studies demonstrated that vaccinating pregnant women against influenza also protected their infants.

"Vaccinating pregnant women is especially important in developing countries," he says. "Here in the United States, premature babies go to the NICU. In many parts of developing countries, there is no NICU. Worldwide, 1 million deaths are associated with preterm births."

Omer's findings helped lead the World Health Organization to recommend the use of the influenza vaccination globally, especially among pregnant women. He currently is heading up a study in Pakistan, the first one in the world to look at pertussis vaccination of pregnant women and the impact on their infants.

But what affects a woman's decision to get a vaccination for herself or her child? Omer has shown that the key is a woman's relationship with her health care provider. Women are more likely to get vaccinated during pregnancy and more likely to have their children vaccinated if their health care provider recommends doing so.

"Health care providers are the most trusted source of immunization information," Omer says. "How physicians approach vaccination with parents has an impact on vaccination update rates. If vaccination is treated as a routine part of care, then children are more likely to get boosters."

Vaccine noncompliance, or vaccine refusal, raises everyone's risk of disease, he notes. "Vaccine-preventable diseases such as measles, influenza, and pertussis often start among persons who forego vaccinations, spread rapidly within unvaccinated populations, and also spread to other subpopulations."

In California, officials attributed a 2010 pertussis outbreak to waning immunity from vaccines. But Omer and his colleagues were the first to determine that, in fact, areas with high rates of children entering

kindergarten with a nonmedical exemption for vaccines were 2.5 times more likely to be living in a pertussis cluster. The state's rate of nonmedical exemption more than tripled during the 10 years prior to the outbreak.

Today, approximately 3% of U.S. parents are hard-core vaccine skeptics, according to studies. Another 25% are "fence-sitters," who may decline some but not all child vaccines, and they should be the focus of the public health community, Omer says. "We don't want them to move into the refusal group."

What helps keep them out of the refusal group is a wearisome exemption policy, one that

requires several steps, not simply checking a box on a form. States with easier exemption policies have higher rates of infectious disease than those with a multistep process, Omer says. "We want to nudge the balance of convenience."

His research on the California pertussis outbreak helped inform policies in other states.

"The bottom line is that vaccines are still one of the most effective tools we have for preventing disease in children," he adds. "Maintaining high levels of vaccine coverage will help ensure that we keep the progress we've made in eradicating or warding off childhood diseases."—*Kay Torrance*

"Vaccine-preventable diseases often start among persons who forego vaccinations and spread rapidly."

—Saad Omer



# Ensuring the rotavirus vaccine works better

MALNUTRITION MAY IMPEDE ITS EFFICACY  
IN DEVELOPING COUNTRIES LIKE BOLIVIA

**AT A CITY HOSPITAL IN BOLIVIA, MOTHERS AND THEIR BABIES LINE UP EARLY IN THE MORNING** and wait patiently to receive a free childhood vaccination against rotavirus. This common virus causes diarrhea severe enough to claim the lives of more than 590,000 children under age 5 worldwide each year. Most live in developing countries like Bolivia.

Since the Bolivian government introduced it in 2008, the rotavirus vaccine has yielded dramatic results overall, averting 6,400 hospitalizations and 500 deaths annually. But Juan Leon, a Rollins researcher who



was born in Peru and lived in Bolivia as a teenager, believes the vaccine could be more effective. As studies show, vaccine efficacy ranges from 18% to 64% in low-income countries, compared with 77% to 98% in higher-income countries.

Researchers point to a number of possible reasons for the difference—chronic exposure to infections, maternal antibodies, or malnutrition, among others. In a country where a quarter of the population is malnourished and many more experience food insecurity, Leon sees reducing malnutrition as the key to

improving vaccine response in Bolivia. Until now, no other researcher has looked at severe chronic malnutrition and vaccine efficacy, according to Leon.

“Whether we get positive or negative results, this study can inform policy,” says Paulina Rebolledo, an Emory infectious disease expert working with Leon on his study. “If it’s not nutrition, then we can turn our attention to something else. If there is a link, then Bolivia and other countries can look toward possibly implementing a booster or supplementing the vaccine with nutrition.”

In an earlier study, Leon’s team examined the cost-effectiveness of rotavirus vaccination. His study proved that the vaccine was the best option compared with vitamin A, oral rehydration therapy, and other interventions to prevent diarrhea in young children.

“We shared the results with the government, and based on those



**Juan Leon (center) was inspired by his late parents to focus his research in Bolivia. Both worked for UNICEF.**

arguments, Bolivian health officials decided to continue the free vaccination program through the end

of 2017,” says Leon. “Then we thought, ‘OK, what’s next?’ We still think the vaccine is the best intervention for reducing diarrhea to benefit the population. So how can we make the vaccine work better?”

Leon’s team is now following 400 mothers and infants, noting their nutritional intake and the babies’ height and weight over the course of a year. Preliminary findings show up to 20% of infants are chronically malnourished and up to 40% are anemic.

“The high prevalence of iron deficiency in infants at 6 months of age is troubling since this is a peak time of brain development and transition to oral foods, as well as increased risk for diarrhea and other infectious diseases,” says Parminder Suchdev, associate professor of global health.

Since 2004, Leon has focused his research in Bolivia, largely because of his late parents. Both worked for UNICEF in several countries, including Bolivia, where his father developed successful programs to improve adult literacy, preschool education, water and sanitation, and food security. His mother empowered rural communities in Bolivia to develop preschool education programs, called Wawa-wasi, run by community women known as promotoras. Sadly, Leon’s mother died in a car accident following a training session for promotoras in rural Bolivia. The women she trained erected a statue in a small town to honor her work in educating Bolivian children.

“Our family has given much to Bolivia, and in turn, Bolivia has given much to our family,” says Leon, who also has a sister. “Our team at Rollins aims to improve the health of Bolivian children, and through them, the health of children worldwide.” —*Kay Torrance and Pam Auchmutey*

# Lessons in China Q&A

## THE EFFECTS OF A DEVASTATING FAMINE FOLLOW CHILDREN INTO ADULTHOOD

**THE CHINESE FAMINE OF 1959–1961 MAY HAVE BEEN THE WORST IN HUMAN HISTORY, KILLING AN ESTIMATED 16 MILLION TO 40 MILLION ADULTS AND CHILDREN**



**AS A BOY IN HONDURAS, REYNALDO MARTORELL LIVED ON A BANANA PLANTATION, WHERE HIS FATHER EARNED A FAIR LIVING.** He often walked along the outskirts of the grounds, noting the difference between living conditions on the plantation and in the villages abutting it. The homes outside the plantation lacked running water and electricity. Malnutrition was chronic, and children were stunted. Though Martorell's family was not rich, they were better off than people who lived in the villages.

Since then, he has devoted his life's work to calling attention to the interplay between maternal and child nutrition. He was one of the first investigators to trace the long-term impact of improved childhood nutrition on health and development. In Guatemala, he studied a group of adults 40 years after they had participated in a nutrition trial as young children. Martorell connected their nutrition as infants to a range of outcomes as adults, including body size, cardiovascular disease risk,

intellectual functioning, and wages. Better nutrition as children resulted in better outcomes as adults.

Today, Martorell is the Robert W. Woodruff Professor of International Nutrition and former chair of the Hubert Department of Global Health at Rollins. His honors include the Carlos Slim Award for lifetime achievement in research benefitting Latin American populations and election to the Institute of Medicine. He also serves as an adviser to UNICEF, the World Health Organization, and the World Bank.

Martorell continues to study the effects of childhood nutrition on adults in Guatemala in collaboration with global health professor Aryeh Stein and has undertaken projects in Mexico, Vietnam, India, and China. In the following Q&A, Martorell discusses his latest work to study the effects of the Great Chinese Famine on adults who experienced it as babies and young children during the late 1950s and the early 1960s.—*Kay Torrance*

### **Why study the Great Chinese Famine of 1959–1961?**

The Chinese famine may have been the worst in human history, killing an estimated 16 million to 40 million people. It resulted from Mao Tse-tung’s “Great Leap Forward” campaign. He wanted to quickly industrialize China, so he forced people living in rural provinces into communes and put his attention and resources into massive industrialization. Soon there were sharp declines in crop production, and what little food that was produced was shipped to cities. There was little to eat for several years, and millions of people starved to death.

I have researched the long-term consequences of poor nutrition in early life, particularly in utero and the first two years (often called the first 1,000 days) for a long time. My early work showed that babies who were malnourished in utero and during their first two years of life were likely to be stunted and have lower IQs. So studying the effects of the famine was an extension of my interests. Starving is a horrible and senseless way to die, but I’ve often wondered about the millions of children who survived the famine. How are they faring today? So I began a series of studies with colleagues in China and with Cheng Huang, who was a postdoc at Emory. He’s now an economist with the Department of Global Health at George Washington University and developed the analytical model that we used in these studies.

### **What did you expect to find?**

The first 1,000 days is a period of rapid organ development, includ-

ing the brain. We expected to find that exposure to famine in early life would have a broad range of detrimental health effects in adulthood. And indeed we found that these now-adults have an increased risk of hypertension, overweight, and mental illness. Other researchers in China have reported effects related to schizophrenia and income.

Studying the Chinese famine is challenging because it was nationwide and didn’t have an abrupt beginning or an end. We relied on

therefore one would expect smaller babies. We think this counter-intuitive finding is due to survival selection. Fertility was sharply reduced during the famine, and fetal and neonatal mortality significantly increased. Women conceived during the famine and exposed to it as infants must be a very select sample and may represent a “hardy” group with a greater potential for growth, which was dampened by the famine but expressed in the next generation.



**Reynaldo Martorell’s nutrition studies include examining anemia rates among schoolchildren in rural China.**

comparing cohorts exposed to the famine during pregnancy and after birth to cohorts born much earlier (exposed at later ages) or after the famine (unexposed). We looked at data sets from large studies or surveys that included adults born before, during, and after the famine.

### **Did your findings surprise you?**

Yes. In one study we found that babies born to women exposed to the famine in early life gave birth to bigger babies compared with unexposed women. This is puzzling because we demonstrated in the same data set that such exposure led to women being shorter as adults;

a variety of health and economic outcomes.

### **How would you like the results of these studies to be used?**

Our findings point to the importance of good nutrition in early life for future health and well-being. We hope that China and other societies across the world will take this to heart and invest in women and children. For example, Chinese women are still affected by iron-deficiency anemia and other micronutrient deficiencies, especially zinc. Improving programs to distribute these supplements should be a top item on China’s public health to-do list. ■

### **Are you doing any follow-up to these studies?**

Cheng and I recently completed two studies, one that shows that early life exposure to the famine led to a greater risk of low IQ and speech disabilities and another that shows famine exposure was linked to greater risk of an increased concentration of protein in urine, suggesting impaired kidney function. We also want to do two more studies—one on famine and cardiovascular disease risk in adults and another on

# Protecting kids at home

## ASSESSING THE RISKS OF FURNITURE FLAME RETARDANTS



**CRAWL AROUND ON THE FLOOR AND YOU CAN EASILY SEE HOW MANY INNOCUOUS HOUSEHOLD ITEMS COULD HARM A CURIOUS YOUNG CHILD.** An open stairway, the sharp corner of a coffee table, an electrical outlet. That soft, cushy sofa is also a trouble spot, points out Rollins environmental researcher Lyndsey Darrow (seated above).

Inside sofas and upholstered chairs is a type of furniture foam doused in flame-retardant chemicals, including a class of compounds called polybrominated diphenyl ethers, or PBDEs. The chemicals can migrate into dust that is inhaled or ingested and, as studies have shown, can disrupt the endocrine system. Young children are especially vulnerable to exposure because they frequently put their hands and objects in their mouths.

Darrow wants to know how much of these chemicals children are ingesting. She currently is studying 80 Atlanta-area children ages 2 to 5 to measure their exposure and what changes in hormone levels, if any, result.

“These compounds are very persistent,” she says. “They attach to fat cells and are stored in the body for a very long time. There is growing evidence they disturb thyroid function, which can lead to hyperactivity and sleep disturbances.”

So far, most of the children have high chemical levels in their system, and two have an amount 10 times higher



than the others, leading Darrow to wonder if the two children ate a piece of furniture foam to have such an elevated reading.

“Older furniture has more of the chemical compounds that we are measuring in this study,” she says.

“While there has been concern about these particular compounds recently, chemical companies have simply substituted them with other compounds that have similar chemical structures.”

California recently passed a law making it easier to meet furniture inflammability standards without using chemical flame retardants. Darrow hopes the law will prompt large manufacturers to make flame retardant-free furniture available nationwide. Currently, only a few manufacturers offer this type of furniture.

“In time, this research may lead to safer consumer products on the market, much like the success story of when lead was removed from paint after lead exposure was found to be harmful to children,” she says.—*Kay Torrance*

# Small nutrients, big impact

## ONE WOMAN'S CRUSADE FOR HEALTHIER MOTHERS-TO-BE IN INDIA AND BEYOND

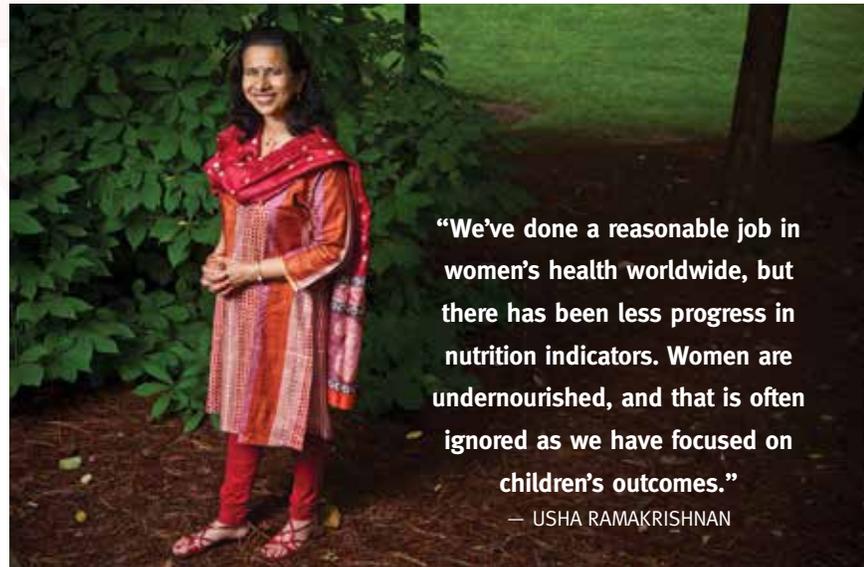
**BORN AND RAISED IN INDIA, USHA RAMAKRISHNAN HAS SEEN HER HOMETOWN MAKE TREMENDOUS STRIDES IN HEALTH.** Maternal mortality has decreased substantially over the past two decades. The country has initiated almost universal access to prenatal care, and severe malnutrition has ebbed.

But women, especially those of childbearing age, are still undernourished. India's focus, and that of other countries too, should be on encouraging women to improve their diet before and during pregnancy to help ensure healthier babies, says Ramakrishnan, professor of global health and director of the doctoral program in nutrition and health sciences.

"We've done a reasonable job in women's health worldwide, but there has been less progress in nutrition indicators," she says. "We've saved the child, but what is the quality of life? Women are undernourished, and that is often ignored as we have focused on children's outcomes."

Women who are undernourished are more likely to have low birth weight babies, preterm births, and babies with birth defects or impaired cognitive development. Interventions historically have targeted women once they become pregnant. That's where the game plan needs to change, she says.

In India, for example, the government has begun handing out



**"We've done a reasonable job in women's health worldwide, but there has been less progress in nutrition indicators. Women are undernourished, and that is often ignored as we have focused on children's outcomes."**

— USHA RAMAKRISHNAN

supplements containing iron and folic acid to girls and young women. If women get in the habit of taking supplements as teenagers or young adults, they will continue to do so during pregnancy, she says.

"The public health community often gets hung up on the cost of such initiatives," says Ramakrishnan. "People often ask, 'How can we ask developing countries to pay for this?' But if organizations and governments are truly driven by science, they should recommend this. In a broader sense, this is about empowering women. But it's a slow process. We're trying to change behavior at all levels."

In Vietnam, where Ramakrishnan has studied women of reproductive age, she found they were eating mostly carbohydrates, often

from rice, a cheap and readily available staple. Subsequently, the women had low intakes of iron and zinc, among other micronutrients.

Ramakrishnan now leads a study there in which 5,000 women of childbearing age were given micronutrients, including folic acid. At year's end, her research team will look at the health and development of the more than 1,600 babies born to these women to see how well their infants are faring.

"I chose to go into nutrition because I wanted to do something for the community," she says. "My goal in India and Vietnam is to help create greater demand for improving women's nutrition. If women start demanding these services, their health and the health of their babies will improve."—*Kay Torrance*



A parent who pushes a child to eat broccoli but drinks a “forbidden” soda sends clear and unintended messages about healthy eating, notes Solveig A. Cunningham.

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# Obese child, obese adult?

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IS CHILDHOOD OBESITY REVERSIBLE OR INEVITABLE?

BY SOLVEIG A. CUNNINGHAM, ASSISTANT PROFESSOR OF GLOBAL HEALTH

ONLY A MINORITY OF CHILDREN WHO ARE OBESE AT ANY POINT IN CHILDHOOD BECOME NORMAL WEIGHT LATER. WEIGHT TRAJECTORIES SEEM TO BE SET IN PLACE EVEN EARLIER IN LIFE THAN MOST OF US WOULD EXPECT.

**FOUR-YEAR-OLD JOHNNY IS HEAVY FOR HIS AGE. “OH, HE’S GETTING READY TO SHOOT UP,” SAYS HIS MOTHER, WHO THINKS HE’S ABOUT TO EXPERIENCE A GROWTH SPURT.** Or is he?

Johnny may be among the 12% of American children who are obese by age 5. The prevalence of childhood obesity in the United States has almost tripled during the past three decades. According to the most recent national estimates, 32% of American children are overweight and another 17% are obese. Given the associations between obesity and diabetes, cardiovascular disease, and other major health problems, the implications for any obese child (or adult) are serious. But will an obese child grow up to be an obese adult?

Adults often find that excess pounds are hard to shed. Now we are learning that weight tends to accumulate rather than dissipate for young children. One in three overweight kindergartners will be obese in middle school—a fourfold greater risk of obesity than their normal-weight classmates. Among children who were obese during middle school, nearly half were overweight when they began kindergarten. And managing weight only gets harder with age: For teenagers who are obese in high school, only 2% are normal weight when they are in their 30s. Sadly, once a child becomes obese, he or she is at great risk of being obese for life.

Chubbiness in children is often dismissed as baby fat or as a phase of growth; indeed, having a child who is big for his or her age is often a point of pride for parents, who are eager to ensure that their babies are growing and eating sufficiently. Childhood is a time of major developmental changes, and some children grow faster and bigger than others. Still, there is mounting evidence from my research team at Rollins and other experts that if children are heavy for their height given their age and gender, they are at great risk of becoming obese. Only a minority of children who are obese at any point in childhood become normal weight later.



Weight trajectories seem to be set in place even earlier in life than most of us would expect. Obese parents tend to have obese children. A child’s body proportions are linked to those of his or her father and even more strongly with those of his or her mother. The mother’s own weight during pregnancy and whether she has diabetes are risk factors for obesity in the next generation. Babies born large—more than 8 pounds, 8 ounces—represent only 12% of babies in the United States yet make up 36% of obese middle-schoolers.

The extent to which family similarities result from shared behaviors between parents and children, biological predispositions, or a combination of the two, are yet to be better understood. However, identifying children who are at higher risk of obesity is an important step in understanding which families could benefit most from prevention efforts. Programs that have been most successful in treating childhood obesity engage the entire family and elicit behavioral change not just from the child but also from other family members.

Adults are models for children, including their habits and preferences about eating and physical activity. Children imitate what they see others doing and so can form healthy or unhealthy behaviors. Even as toddlers, children start taking cues from their surroundings and others around them as they decide what they like, what to eat, and how active to be. Children like to eat and do what their parents like, and a parent who pushes a child to eat broccoli but drinks a “forbidden” soda sends clear—and unintended—messages. Pressuring children to eat well can place value on unhealthy foods and devalue healthy foods, and pushing them to eat more or less can deregulate their eating by separating the act of eating from the feeling of hunger. While some health professionals think of healthy living as “common sense,” it may not be as simple as it sounds—with an obesity epidemic as standing proof of that complexity. Now is the time, while Johnny is in preschool, to help him not top the growth chart and set his course to a healthy adulthood. ■

# No-smoking zone

## CHANGING SMOKERS' HABITS TO PROTECT CHILDREN AT HOME

**HOW UNSAFE IS IT FOR CHILDREN WHEN THERE IS A SMOKER IN THE HOUSE?** Home is the No. 1 place for secondhand smoke exposure for children and nonsmokers, says Michelle Kegler, director of the Emory Prevention Research Center and professor of behavioral sciences and health education at Rollins. Secondhand smoke, she adds, is linked to worsening asthma and lower respiratory tract infections in children.

According to the CDC, approximately 18% of American adults smoke despite health warnings and a public that is generally scornful of smokers. Most smokers report trying to quit multiple times. How to effectively help them quit is a vexing public health problem, compounded by the fact that adults often smoke at home with children present.

Kegler, along with colleagues Carla Berg, Regine Haardörfer, and Cam Escoffery, worked with the United Way of Greater Atlanta to recruit smoking households to participate in a project to create home smoking bans. Families who called United Way's 2-1-1 helpline and had at least one smoker in the home enrolled voluntarily in the study. They received three mailings and one coaching phone call to help them develop a "no-smoking" zone inside the home.

"Many of these families have children, and this is one way of protecting them," Kegler says. "We are reinforcing a norm that smoking is bad for health. This program is another social force to discourage smoking."

Kegler sees the program's structure as key to its potential success. There are no long counseling sessions to attend, and the smoker is not being asked to quit. "It's a quick and easy intervention," she says of the program now being tested in North Carolina and Texas.

In the study's first group of 498 households with smokers, 100% allowed smoking inside the home at the beginning of the program. At the program's completion, 40% had totally banned smoking inside, compared with 25% of the control group. Smokers reported smoking fewer cigarettes per day. Because the interven-



tion was successful, fewer children and nonsmoking adults will be exposed to secondhand smoke, and more smokers may be on the path to quitting.

Kegler agrees that current anti-smoking measures are working, particularly cigarette taxes, which have been shown to prevent young people from smoking. While cessation programs are valuable for current smokers, she says, public health interventions have changed social norms around smoking and prevented many people from taking that first puff.—*Kay Torrance*

**Home is the No. 1 place where children breathe secondhand smoke, says Michelle Kegler.**

# A healthy alliance

## INSURERS TACKLE CHILDHOOD OBESITY

**A FEW YEARS AGO, COMMUNITY LEADERS ASKED KIMBERLY RASK TO SERVE ON A COALITION TO ADDRESS CHILDREN'S HEALTH IN THEIR RURAL COUNTY IN SOUTHEAST GEORGIA.**

Their request was prompted by a hard lesson. When a new prison opened, two-thirds of the employees came from outside the county. Many of the in-county residents who applied for jobs were too overweight to meet the physical requirements for prison work.

“They wanted a healthier workforce to provide more jobs,” says Rask, associate professor of health policy and management.

Georgians have reason to be concerned about overweight and obesity. According to the nonprofit Alliance for a Healthier Generation, Georgia is the 20th most obese state for adults and the 10th most obese state for children.

In 2009, the Alliance launched the Healthier Generation Benefit to expand insurance coverage for childhood obesity. To date, 22 insurance companies and self-insured employers are working with 56,000 providers to extend the benefit to more than 2.7 million children. The benefit includes four follow-up visits with a primary care provider and four visits with a registered dietician for children with a body mass index (BMI) in the 85th percentile or higher for their age.

When the benefit was launched,



**Kimberly Rask is evaluating the pros and cons of an insurance benefit to help reduce childhood obesity.**

the Alliance asked Rask and her research team to evaluate its effectiveness. They found, for example, that copayments of \$20 to \$75 often discouraged return visits to providers. Some provider networks lacked a sufficient number of dieticians to serve patients. Infrequent use of billing codes for BMI-specific diagnosis and counseling made it difficult for insurance claim administrators to monitor use of these services by eligible children.

The dearth of billing data for obesity treatment and counseling also made it difficult for researchers

to measure quality of care in their evaluation of the benefit.

Given such barriers, is the benefit destined for greater use and effectiveness? Rask believes that a relatively new health care quality indicator called HEDIS (Healthcare Effectiveness and Data Information Set) will help long term. To be accredited by the National Committee for Quality Assurance (NCQA), insurance companies must use HEDIS measures to gauge quality of health services under the benefits they offer. Three of those measures pertain to childhood obesity—documentation of BMI, counseling about healthy nutrition, and counseling about healthy exercise.

“Many health plans accredited by NCQA have to report that data,” says Rask. “That’s an incentive to put programs in place to promote these measures. Starting this year, we’re switching from using claims data to HEDIS measures to monitor how well health insurance plans cover childhood obesity.”

Rask’s team is now following a practice in California where children visit physicians and nutritionists five times a year to achieve a healthier weight. BMI measurements for some children have plateaued or dropped.

“We think this type of care is going to be a more effective strategy,” says Rask. “The key is to integrate it into routine care.”—*Pam Auchmutey*

# Trumping Spina Bifida

Bridge enthusiasts play to prevent birth defects



**In the world of duplicate bridge, partners move from table to table to play different pairs of opponents.** As Atlanta bridge enthusiasts Janet Edwards and Brenda Shavin well know, some opponents can be downright pesky when they foil your opening bid.

But in the midst of play nearly two years ago, Edwards and Shavin quickly warmed up to their opponents, Rollins epidemiologist Godfrey Oakley and his wife, Mary Ann. They agreed to have dinner to learn more about Oakley's passion—reducing the number of babies born with spina bifida worldwide. By the end of the meal, Edwards and Shavin had volunteered to raise funds for the Center for Spina Bifida Research, Prevention, and Policy (CSB), which Oakley directs.

“When we play bridge, we don't really get a chance

to meet and mingle,” says Edwards, a member of the Duplicate Bridge Association of Atlanta. “When we learned about Godfrey's work with spina bifida, we really wanted to be involved.”

This past spring, the two women co-chaired Godfrey's Grand Slam Bridge Benefit, bringing more than 90 avid bridge players together on a Sunday afternoon at Rollins and raising nearly \$40,000 to support the center's work.

Before the rounds of bridge began, players listened as Oakley discussed his work to prevent spina bifida, received a lesson from *New York Times* bridge columnist Phillip Adler, and bid on chances to partner with bridge professionals at club, sectional, and regional games during a silent auction. Benefit players also met actors Boris Kodjoe and Nicole Ari Parker, founders of Sophie's Voice Foundation.

Named for their 9-year-old daughter who has spina bifida, the Atlanta-based foundation helped establish the CSB in 2012.

The center's primary goal is an ambitious one: global prevention of spina bifida and anencephaly, another neural tube birth defect, by 2024. Currently, the prevention rate is 25%. Spina bifida occurs when a baby's spinal cord and brain form improperly—just 18 days after conception—and can cause nerve damage, brain damage, and paralysis. Children with spina bifida often require 24/7 care. Anencephaly occurs when babies are born without parts of the brain and skull. In most cases, both birth defects can be prevented when women of reproductive age eat foods fortified with vitamin B9, or folic acid.

Oakley is credited with pioneering the effort to add





## FOLIC ACID AND SPINA BIFIDA

- In 1996, the U.S. Food and Drug Administration required that enriched cereal grains sold to consumers nationwide be fortified with folic acid. Today there are 40% fewer cases of spina bifida and anencephaly as a result.
- Some 60 countries now require folic acid fortification, while more than 100 countries do not. The result: 180,000 children are born with spina bifida worldwide each year. That's 18 times the number of children born in the 1950s and 1960s with severe birth defects caused by thalidomide, then used by pregnant women to relieve morning sickness.

Back row: Rollins epidemiologist Godfrey Oakley with Sophie's Voice Foundation cofounders Nicole Ari Parker and Boris Kodjoe. Front row: *New York Times* bridge columnist Phillip Adler, RSPH Dean James Curran, and bridge tournament organizers Brenda Shavin and Janet Edwards.

synthetic folic acid to all grain products produced in the United States. Backed by strong scientific evidence and support from physician groups and the March of Dimes, Oakley's team in the CDC's Division of Birth De-

fects and Developmental Disabilities worked several years to convince the U.S. Food and Drug Administration to mandate folic acid as a food additive in 1996. As a result, a 40% reduction occurred in the number of babies born with spina bifida and anencephaly in the United States.

**The center's primary goal is an ambitious one: global prevention of spina bifida and anencephaly, another neural tube birth defect, by 2024.**

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Since retiring from the CDC as division director in 1998, Oakley has continued

to study, speak, and write about the need to fortify grains with folic acid in other nations. Approximately 60 countries now mandate folic acid fortification for one or more milled grains—flour, maize, and rice. More than

100 countries have yet to mandate grain fortification, resulting in 180,000 babies born with spina bifida and anencephaly each year. CSB conducts research and plays an advocacy role by partnering with parents, physicians, and others to champion spina bifida prevention in their respective countries. The center also collaborates with the

CDC's National Center on Birth Defects and Developmental Disabilities, the Flour Fortification Initiative based at Rollins, and other groups to track and expand fortification efforts.

Oakley has developed quite a following in the course of his life and career. In bridge-playing circles, he goes by "vitb9doc," his moniker for playing online. In public health circles, he is known for working tirelessly so that mothers around the world give birth to healthy babies.

"Spina bifida causes as much disability as polio," says Oakley. "I'm a cheerleader for the prevention of spina bifida. I'm going to keep cheerleading as long as I possibly can."—*Pam Auchmuty*

## HELP PREVENT SPINA BIFIDA



Spina bifida causes as much disability as polio. Learn more about efforts to prevent this birth defect through Sophie's Voice Foundation ([sophies-voicefoundation.org](http://sophies-voicefoundation.org)), the CDC ([cdc.gov/ncbddd/spinabifida](http://cdc.gov/ncbddd/spinabifida)), and the Flour Fortification Initiative ([ffnetwork.org](http://ffnetwork.org)). To make a gift, please contact Kathryn Graves, associate dean for development and external relations, at 404-727-3352 or [kgraves@emory.edu](mailto:kgraves@emory.edu).



Thomas Prol 89OX 91C 97MPH



Reagan Sophia, born to Heather Ingold 00MPH



Judy Lubin 00MPH



Norbu Tamang, born to Chip Barnett 04MPH

## Working the Iditarod



For **JODIE GUEST 92MPH 99PHD**, no vacation comes close to spending two weeks amid an army of volunteers in minus 40-degree temperatures in the remote town of Unalakleet on the Bering Sea in Alaska.

Unalakleet marks the 800-mile point of the Iditarod, the 1,049-mile dog-sledding race from Anchorage to Nome during early March. The route includes 23 checkpoints and three larger hubs, including Unalakleet, where mushers stop to regroup and have their dogs checked out by veterinarians before continuing on.

Guest oversees logistics for the final leg of the Iditarod, a task that includes managing 200 volunteers and the Iditarod Air Force, a small fleet of Cessna planes and their pilots. “We get volunteers to their checkpoints, food to the volunteers, straw and hay for the dogs, and the vets out there,” she explains.

Her father, a Kansas City veterinarian, is one of the 50 vets who staff the race. Guest joined her father there seven years ago.

“It’s quite an event,” she says. “We can’t provide help to mushers or dogs unless a musher decides to drop a dog because of fatigue, illness or injury, or going into heat. We don’t feed or unharness the dogs. The musher works unassisted. Our job is to keep the mushers and the dogs safe.”

Volunteers follow the mushers’ progress using GPS. If a musher stops longer than usual to rest and feed dogs between checkpoints, Guest dispatches a plane for a safety check. “It’s our responsibility to make sure the mushers are moving,” she says. “If they drop out of the race, we help move them to a hub to fly them out.”

The Iditarod seems a world away from Emory, where Guest serves as director of HIV research at the Atlanta Veterans Affairs Medical Center. An epidemiologist by training, Guest teaches at Rollins and the School of Medicine. She often shares her Iditarod experiences with Atlanta-area elementary school students. “I love coming back home and teaching kids about it,” she says.

Guest also finds solace and renewal in the beauty of Alaska, its wildlife, and the excitement generated by the dogs and their mushers. “It’s the ultimate dad-daughter trip,” she adds. “It’s amazing.”—*Pam Auchmutey*

## 1990s

**M. MICHELLE BERREY 86OX 88C 92MPH** was named president and CEO of Chimerix, a biopharmaceutical company that develops oral antivirals. She joined Chimerix in 2012 as chief medical officer. The company is based in Durham, N.C.

**THOMAS PROL 89OX 91C 97MPH** was named first vice president of the New Jersey Bar Association. He is the first openly gay officer in association history and has been a vocal advocate of marriage equality and a 2011 law to combat bullying in public schools. He practices environmental and government affairs law with Laddey, Clark, & Ryan in Sparta, N.J. He is on track to become state bar president in 2016.

## 2000s

**BORN:** Reagan Sophia to **HEATHER YORI INGOLD 00MPH** and her husband, John, on Jan. 4, 2014. The family lives in Atlanta.



Alison Smith 05MPH



Daniel Thompson 01OX 03C 08MPH



Kelly Callahan 09MPH



Barbara Do 09MPH and Nick Greene

**MARRIED: SARAH KURZ 00MBA/00MPH** to Edward Barker Jr. on July 26, 2014, in Southport, Maine. Kurz develops commercial strategy for Merrimack Healthcare Solutions, a biotechnology company in Cambridge, Mass.

**JUDY LUBIN 00MPH** was awarded a PhD in sociology from Howard University in May. She wrote her dissertation on *Race and the politics of health reform: Antigovernment opposition to national health insurance from the New Deal to the Affordable Care Act*.

**TOLTON PACE 00C 02MPH** was selected to participate in the DeVos Urban Leadership Initiative, a 15-month faith-based leadership development program for urban youth workers.

**MARRIED: KELLEY FRIEDGEN 99C 03L/03MPH** to Kyle Johnson on Oct. 5, 2013.

**CHRISTINE KORHONEN 03MPH** is a research health science specialist with the Department of Veterans Affairs in Salt Lake City.

**BORN:** Norbu Tamang to **PAUL “CHIP” BARNETT 04MPH** and his wife, Neema, in June 2014. Barnett is now a senior technical director with the International Rescue Committee in New York.

**SUSAN HOBSON 05MPH** is a research informatics analyst specializing in research and health sciences information technology at Emory.

**TIELIN QIN 05MPH 11PhD** is a mathematical statistician with the Food and Drug Administration in Washington, D.C.

**ALISON SMITH 05MPH** is an emergency medicine resident in Salt Lake City. She received the Matthew Lee Girvin Award in 2009 from the RSPH Alumni Association.

**BORN:** Chance and Deacon to **ALEXIS FORMAN MORGAN 06MPH** and her husband, Donnell, on Dec. 7, 2013. The family lives in Clinton, Md.

**NIA BRODRICK 07MPH** is a pediatrician with Unity Health Care in Washington, D.C. She recently completed her residency in pediatrics

at the University of Florida at Orlando Health.

**DANIEL THOMPSON 01OX 03C 08MPH** was named deputy for planning and partnerships with the Georgia Department of Public Health. He helps build stronger ties with the state’s health districts to reduce chronic disease and oversees the development of statewide cancer, school health, and chronic disease plans.

**KELLY CALLAHAN 09MPH** was appointed director of the Trachoma Control Program at the Carter Center. She previously served as the center’s representative in southern Sudan, where she introduced the trachoma program. She also played a key role in efforts to eradicate Guinea worm disease and eliminate river blindness as assistant director for program support for all of the center’s health programs. Callahan serves on the RSPH Alumni Board.

**MARRIED: BARBARA DO 09MPH** to Nick Greene on May 25, 2014, in Baltimore. They live in Raleigh, N.C., where Do works as a

research statistician with RTI International and serves as co-president of the Triangle Chapter of the Emory Alumni Association.

**LAURA JOHNSON 10M/10MPH** is a Robert Wood Johnson Foundation Clinical Scholar at the University of Pennsylvania. Her clinical/research interests include pediatrics and population health.

**CHANDRA MCELHANEY 10MPH** was named district training and development specialist for the Cobb and Douglas county public health departments in Georgia.

**KERRI TIMMERMAN 10MPH** is a senior program management analyst with ICF International.

**SHEBA EHTESHAMI 07OX 09C 11MPH** is a senior associate with Grant Thornton LLP in Atlanta. She was named Woman of the Year for health care by the National Association of Professional Women.

**MARRIED: LAUREN TAYLOR 11MPH** to Patrick McShane on May 10, 2014, in Atlanta. She is a clinical research



Margaret Bertram 13MPH



Courtney Peters 14MPH

coordinator with the Emory ALS Center.

**MARGARET BERTRAM 13MPH** is a Presidential Management Fellow in the Office of AIDS Research at the National Institutes of Health in Washington, D.C.

**ROSALYN SCHROEDER 13MPH** joined the Bixby Center for Global Reproductive Health

at the University of California, San Francisco.

**COURTNEY PETERS 14MPH** is a preventive medical consultant with the Oklahoma State Department of Health.

**MEIGHAN TARNAGADA 14MPH** is a research program coordinator for postpartum hemorrhage studies in Africa and Asia with Gynuity Health Projects.

## In Memoriam

**Debbie Shelton, 72**, an RSPH Dean's Council member with a special interest in safe water, died on July 11, 2014, following a long battle with pancreatic cancer. After moving to Atlanta in 1977, Shelton served with the Alliance Theatre as coordinator



of its youth touring company and director of youth programs. She was a key member of the committee working to win the 1996 Olympic Games and joined the staff as program director for venue staffing. Following the Olympics, she was vice chair of hospitality for the PGA Championship at East Lake and board chair of the Alliance Theatre. She also served on the boards

of Starlight Children's Foundation, the Visiting Nurse Health System, Alliance Francaise d'Atlanta, the ARCS Foundation, and the Cathedral of St. Philip. Shelton is survived by her husband, Charles; two daughters; and four grandchildren.

## FROM THE WOODRUFF HEALTH SCIENCES CENTER

# No prouder moment

Reading the stories in this issue of *Emory Public Health*, I am deeply impressed by the many ways that Rollins experts are improving the lives of children and mothers around the globe. They are using the tools of scientific discovery to advance lifesaving changes in public health policy and practice in areas such as vaccine efficacy, chemical exposure, and hun-

ger and malnutrition.

In fact, this is a primary goal of all the schools and units of the Woodruff Health Sciences Center (WHSC)—to improve the practice of health and healing through sound scientific research. Our schools of nursing and medicine, as well as our health system and



primate center, are all engaged in similar efforts to conduct research to safeguard health at home and abroad.

Our range of skills and scientific expertise were put to the test when two American missionaries infected with the Ebola virus were admitted to Emory University Hospital in August, followed by two more patients in September and October. The knowledge that we acquired in successfully treating these patients are being used by clinicians and public health practitioners in the United States, West Africa, and other regions to prevent, treat, and contain the virus.

I could not be more proud of the WHSC and Rollins as they strive in multiple ways to protect the health of children, adults, families, and communities everywhere.

S. Wright Caughman, MD

*Executive Vice President for*

*Health Affairs, Emory University*

*CEO, Woodruff Health Sciences Center*

*Chairman, Emory Healthcare*

# Rollins School of Public Health

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## Obama briefed on Ebola response at the CDC

President Obama visited the CDC in September for an update on the response to the Ebola epidemic in West Africa. More than 700 alumni work at the CDC. See page 7 to learn how Rollins alumni and students are involved in responding to this unprecedented global health emergency.





