



FOGARTY INTERNATIONAL CENTER • NATIONAL INSTITUTES OF HEALTH • DEPARTMENT OF HEALTH AND HUMAN SERVICES

## HHS Secretary says US plays key role in global health

The U.S. has a “very strong” role to play in global health policy, not least in the battle to control Ebola and other threats to the domestic as well as worldwide populations, according to Sylvia M. Burwell, Secretary of the U.S. Department of Health and Human Services, which oversees the NIH.

“The role of HHS in the global health space is going to be front and center,” Burwell said during a recent visit to NIH to tour the main campus and meet staff. She joined HHS last year from the U.S. budget office and soon became steeped in discussions with top world health officials on how to stem the rampant Ebola epidemic in West Africa and prevent similar outbreaks in the future.

In earlier global health experience, Burwell spent a decade at the Bill and Melinda Gates Foundation, where she was founding president of its Global Development Program, which awarded \$1.5 billion annually. One of her focus areas was vaccine needs, including for diseases such as Ebola.

Photo courtesy of NIH



Health and Human Services Secretary Sylvia Burwell visited NIH recently for her first town hall meeting with staff. She was greeted by (from right) NIH Director Dr. Francis Collins, National Cancer Institute Director Dr. Harold Varmus and NIH Deputy Director Dr. Lawrence Tabak.

## NIH Ebola vaccine trial gets underway in Liberia

A large clinical trial to assess the safety and efficacy of two experimental vaccines to prevent Ebola virus infection has begun in Liberia. The trial is being led by a recently formed Liberia-U.S. clinical research partnership and is sponsored by the NIH's National Institute of Allergy and Infectious Diseases (NIAID). The Partnership for Research on Ebola Vaccines in Liberia or PREVAIL, a Phase 2-3 study, is designed to enroll approximately 27,000 healthy men and women aged 18 years and older.

One vaccine candidate, cAd3-EBOZ, uses a chimpanzee-derived cold virus to deliver genetic material from the Zaire Ebola strain, which dominated in Liberia. Published interim results from a Phase 1 trial of this vaccine,

which was co-developed by NIAID scientists and Glaxo-SmithKline, provided necessary safety information and showed that it prompted immune responses to the outer coat of Ebola virus.

The other candidate, VSV-ZEBOV, employs vesicular stomatitis virus, an animal microbe that primarily affects cattle, to carry an Ebola virus gene segment. The VSV-ZEBOV vaccine was developed by the Public Health Agency of Canada and licensed to NewLink Genetics Corporation through its wholly owned subsidiary BioProtection Systems Corporation. Phase 1 trial results of this vaccine also provided safety information and showed that it prompted immune responses to the outer

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## FOCUS



### Nursing research plays critical role in global health

- Nurse scientists discover cloth water filter cuts cholera rates
- Studies aim to lessen emotional misery from HIV/AIDS
- Mothers can reduce daughters' risk for HIV/AIDS, research shows

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## NIH Ebola trial gets underway

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coat of Ebola virus. These results have not yet been published but were made available to the regulatory bodies reviewing the study.

“The scale of the current Ebola outbreak in West Africa is unprecedented, and specific medical countermeasures are needed for this and future outbreaks,” said NIAID Director Dr. Anthony S. Fauci. “It is imperative that any potential countermeasures, including vaccines, be tested in a manner that conforms to the highest ethical and safety standards in clinical trials designed to provide a clear answer to the question of whether a candidate vaccine is safe and can prevent infection.”

Trial participants will be divided into three equal-sized groups that will receive either a placebo or one of the two vaccines. The trial will be double-blinded so that neither subjects nor staff will know if a vaccine or placebo was administered. The study is expected to last about 12 months.

Photo by Cathy Kristiansen



Brazil's Dr. Carlos de Brito Cruz and NIH Director Dr. Francis Collins have launched an initiative to advance research collaborations between their countries.

### NIH, Brazil launch novel funding program

The NIH and a major research foundation in Brazil have initiated a groundbreaking program that is expected to expand global health research by making it easier to fund scientific collaborations on valuable projects. The agreement was formalized recently by NIH Director Dr. Francis S. Collins and Dr. Carlos H. de Brito Cruz, scientific director of the São Paulo Research Foundation (FAPESP). The two organizations will jointly fund projects involving international collaborative teams that cover any topic of mutual interest. NIH will perform the peer review. This is the first NIH parallel funding agreement establishing a science collaboration model with a foreign partner that covers such a wide range of potential research areas.

## Medical education partnership aids Ebola response



U.S. support for medical education and research in sub-Saharan Africa has enhanced the region's Ebola response.

Sub-Saharan African medical and nursing schools are building capacity that is essential to containing future outbreaks of Ebola and other infectious diseases, by building skills among health care workers and supporting research to identify locally effective approaches.

Many African schools active in the Ebola response are part of the U.S.-sponsored Medical Education Partnership Initiative (MEPI) network, established to increase the quality and quantity of

health care workers on the continent. In just five years, the schools have revamped their curricula, enrolled many more students, retained faculty with incentives such as research opportunities and broadened outreach to rural areas. This expansion has enhanced Africa's ability to respond to Ebola.

“MEPI schools are working in different ways to control and prevent not only the Ebola epidemic but others that

may occur in the future,” according Dr. Francis Omaswa, principal investigator at MEPI's Coordinating Center.

MEPI-supported capacity has contributed to Africa's Ebola battle in various ways. South Africa's Stellenbosch University, for example, has offered a weeklong course on Ebola and several of its faculty joined a consortium investigating whether immune plasma from Ebola survivors can benefit ill patients. In Mozambique, medical school faculty devised a public brochure describing Ebola symptoms, transmission modes, prevention and treatment, while a key training hospital held special sessions for medical residents and students on Ebola diagnosis and disease recognition, personal protective materials and related topics. Meanwhile, Ghana's MEPI program helped prepare the country's frontline health professionals to identify, diagnose and treat Ebola patients, as well as educate the general public about the disease. The MEPI team helped develop a long-term national strategy for Ebola and is supporting the health system assume its new role as WHO coordinating hub for West Africa. Finally, Nigeria's MEPI effort hosted several Ebola-related lectures and training workshops to raise public awareness and inform the health care community.

MEPI is funded by the U.S. President's Emergency Plan for AIDS Relief and NIH, and is administered by Fogarty and the Health Resources and Services Administration.

Photo by Richard Lord for Fogarty

# Measuring health impact of indoor air pollution is key

In her hut in Zimbabwe, a mother stirs cornmeal in a pot above a wood fire, while the baby nestled on her back dozes. They are breathing in smoke laced with contaminants, their immune systems are chronically on overdrive and they face an increased risk of disease and early death.

Scientists are developing an array of interventions to prevent the 4 million premature deaths each year and other health burdens that the WHO attributes to indoor air pollution. Many projects encourage cleaner ways to cook and heat homes—currently more than a third of stoves use wood, dung, crop residues or other so-called biomass—or to ventilate the smoke better. Yet even as the global community rallies behind a range of interventions, there is no clear-cut way to evaluate exposure levels in individuals and the possible benefits of interventions to human health. Researchers hope to identify and establish a standard panel of indicators and biomarkers—physiological measures or molecules in bodily fluids or tissues—that can provide more precise evidence of effectiveness.

Developing the best targets for different exposure conditions is important for efficiency and precision and is critical to making valid comparisons between studies, said Fogarty senior scientist, Dr. Joshua Rosenthal. “We don’t want scientists to reinvent the wheel every time they go out and work with different markers.”

To spur research into biomarkers, especially those tied to the noncommunicable diseases commonly caused by indoor air pollution—such as cancer, respiratory conditions and cardiovascular disease—the public-private Global Alliance for Clean Cookstoves, in coordination with the NIH, recently held a meeting in Washington, D.C. The Alliance has about 1,000 public and private partners, including the NIH Common Fund, and plans to introduce 100 million clean cookstoves by 2020.

Speakers discussed a range of tests that have been used in studies on indoor air pollution and health. For instance, one team gauged cardiovascular disease by analyzing blood levels of a commonly tested protein tied to inflammation, C-reactive protein. Meanwhile, a team in India investigating hypertension used an automated device to record blood pressure and blood tests for readings on platelets, lipoproteins and antibodies.

Researchers studying lung function have looked at carbon monoxide levels in exhalations during cooking, to assess exposure levels. Many projects have measured breath capacity such as forced expiratory volume—a test for how much air can be rapidly pushed from the lungs—

Photo by Rezouli Haque, courtesy of PhotoShare



Researchers met recently to discuss how to use biomarkers to more accurately measure the exposure and health impact of indoor air pollution.

but one multi-country study highlighted a complexity inherent in many biomarkers: normal lung capacity can vary substantially depending on age, height and sex, and also between regions of the world, based on genetic, socioeconomic and environmental factors, making it harder to compare healthy levels.

Aside from carbon monoxide, other common contaminants found in smoke from cooking are particulate matter and organic compounds known as polycyclic aromatic hydrocarbons (PAH). The latter can now be detected in urine, providing another exposure marker for scientists.

Researchers must devise appropriate biomarker tests that are low-cost, portable for use in remote areas, can sustain temperature fluctuations in the absence of refrigeration, and generate reproducible results. In a recent project in Honduras, rather than drawing blood from participants, researchers used a cheaper, more convenient method—collecting blood samples on filter paper via finger pricks and drying them at room temperature. These spots are sufficient for analyzing many markers of cardiovascular health, as well as diabetes and other diseases. Another type of biomarker with potential use in this field is DNA readings from saliva, which could produce evidence of chronic illness.

Meeting attendees emphasized the potential for researchers to leverage existing studies to evaluate possible indicators and biomarkers for chronic respiratory and cardiovascular disease, so they can more accurately measure and demonstrate the benefits of clean cookstoves.

## RESOURCE

Links: [http://bit.ly/NIH\\_indoorairpollution](http://bit.ly/NIH_indoorairpollution)

# PROFILE

## Fogarty nursing fellow oversees HIV trials in India

By Cathy Kristiansen

Faith Beulah has helped orchestrate India's part in some of the world's most important multisite HIV/AIDS clinical trials, quietly coordinating a team comprising nurses, laboratory technicians, counselors and pharmacists as they test drug regimens aimed at preventing or limiting harm from the virus. One such trial, supported by NIH, found that an infected person could avoid spreading HIV sexually to a partner by taking antiretroviral drugs—a result heralded as a science breakthrough of the year in 2011.

As the site coordinator in the Clinical Trials Unit at YRGCARE in Chennai, Beulah has a wide range of responsibilities to ensure trials proceed in a consistent, professional manner and that every problem that arises—from wrinkles in data collection to severe adverse reactions in study participants—is handled appropriately. She's the planner, trainer, implementer and troubleshooter. Regarding the nuts and bolts of the trials, she helps develop standard operating procedures, trains and motivates staff who will be involved and makes sure the protocols are set in motion exactly as planned.

Beulah joined YRGCARE as a nurse researcher after completing her master's degree in nursing and within months received a yearlong Fogarty fellowship supported by the NIH's National Institute of Nursing Research. Orientation entailed traveling to the NIH for three weeks of training, her first time outside of India. Beulah recalls, "We learned what research is all about, the different types of projects we can do, how to design and launch a research project. That was a good learning experience."

Back at home, she hit the ground running, being assigned to coordinate about 10 ongoing randomized clinical trials, under the mentorship of YRGCARE's Dr. N. Kumarasamy. One of the earliest studies under Beulah's wing was a global investigation of whether infants whose mothers took antiretroviral treatment during pregnancy, labor and postpartum suffered



### Faith Esther Beulah, M.S.

Fogarty Fellow:	2007 - 2008
Fellowship at:	YRGCARE, Chennai, India
U.S. organization:	Vanderbilt University
Current position:	Clinical Trial Coordinator, YRGCARE

related harm. The research, with arms located in India, Thailand and Africa, reassured physicians the world over that the mothers' moderate antiretroviral drug doses were not tied to any defects, deaths or illness in their infants. Another trial helped boost HIV treatment adherence by demonstrating that once-daily drug regimens were as effective as twice-daily dosing. Importantly, the study also revealed that the safety and effectiveness of some antiretrovirals can differ between women and men.

It was serendipitous that Beulah began in the HIV field, with the coordinating position open just as she was job hunting. "I had been a nurse in the hospital and worked as a tutor, did my master's, then thought it would be a different experience to do research," she said. "As for nursing, in my family, most are teachers or engineers, so I decided to be different and try nursing."

Beulah also enjoys the teaching aspect of her work, disseminating what she learns from trials to other health care staff and giving feedback from international conferences she attends. She cited an example from one of the project meetings in the U.S.—that hair sample testing can indicate antiretroviral drug adherence levels. Adherence is an important aspect of managing HIV treatment in India so she held a training session for staff on returning home.

Beulah credits her fellowship experience for influencing her career. She said, "It gave me the groundwork to be competent in helping administer clinical trials, made me confident enough to talk about research with the scientists here. Now, with this rich experience in hand, I feel I can contribute a lot more in coordinating and implementing future clinical trials effectively."

## PATRICIA GRADY, PH.D., R.N., F.A.A.N.

*Dr. Patricia A. Grady became director of the NIH's National Institute of Nursing Research (NINR) in 1995. Her prior position was acting director of the National Institute of Neurological Disorders and Stroke, which she joined in 1988. An internationally recognized researcher, Dr. Grady's focus has been on stroke, with an emphasis on arterial stenosis and cerebral ischemia. Before NIH, she held academic positions, including at the University of Maryland, where she had obtained a master's degree in nursing and a doctorate in physiology. She was elected to the Institute of Medicine in 1999.*



### What's the role of nursing research in global health?

In September 2000, the UN highlighted eight objectives known as the Millennium Development Goals for the world community. Nurses and nursing science play an important role in virtually all of these. However, our impact is most obvious in reducing child mortality, improving maternal health, and combating HIV/AIDS, malaria and TB, along with the prevention and management of chronic conditions. Particularly in low- and middle-income countries, nurses and nurse scientists can help fill a critical need for the education and training of health workers, as well as designing and testing solutions to common health problems.

Approximately 1 billion people across the world have zero access to trained health workers. Many projects we support have shown that low-tech, local health care solutions—such as sari cloth filtering of water in Bangladesh—can be more beneficial than high-tech treatments.

### What are examples of NINR's global health successes?

NINR-supported researchers are integrating depression screening into HIV care in Southern India. UNAIDS estimates that 2.5 million of the 34 million people living with HIV are in India. Connecting this population to mental health resources and interventions to treat depression could lead to improved quality of life for those dealing with the multiple burdens of HIV. In Bangladesh, NINR co-funded a study that aims to reduce postpartum hemorrhage, the leading worldwide cause of maternal death and disability. We also support studies in community-based outreach that show promise to lower the incidence of childhood diarrhea. As I mentioned, an NINR-funded study involved the use of a sari cloth filter to decrease the incidence of waterborne cholera. This is a sustainable intervention that elegantly utilizes readily available, low-cost material while empowering women. NINR is the lead NIH institute for research in advancing end-of-life care, which presents

some of the most critical challenges in clinical care today. An NINR-funded end-of-life bereavement study conducted in South Africa showed the remarkable resiliency of adolescents who have lost a loved one to AIDS.

### How is NINR engaged in research training?

NINR partners with Fogarty on a number of research training projects. One example is the University of Illinois at Chicago's School of Public Health and College of Nursing's AIDS International Training and Research Program. This multidisciplinary effort fosters long-term scientific capacity to address the AIDS epidemic in Chile, Indonesia and Malawi through hands-on training. Another example is a new interdisciplinary project working with local health care workers in Argentina to study the efficacy of a text messaging intervention to improve medication adherence in TB patients.

### What are NINR's global health plans looking forward?

Nursing science has always been based on interdisciplinary collaborations. The WHO has acknowledged the importance of international research collaborations through the designation of Nursing Collaborating Centers, which focus on team-based research of regional or global significance. NINR will continue to facilitate global training partnerships, promote earlier entry of nurses into research training programs, and strengthen the scientific basis for clinical practice. We will also work to integrate technology and advanced interdisciplinary research methods. Data science will remain vital, including use of "big data" from electronic health records, wearable devices, mHealth, point-of-care diagnostics, data visualization and various non-health specific data such as GPS, Google Maps and social media.

NINR will continue partnering with Fogarty and other members of the global health community to identify areas in need of research, disseminate scientific findings and foster international relationships among investigators.

## Nursing research and training spur global health gains

**N**o profession is more integral and essential within every level of global health care than nursing. Because of their close relationship with patients, nurses are ideally positioned to design and drive scientific discoveries that can be implemented directly into clinical practice. Since 1986, the NIH's National Institute of Nursing Research (NINR) has been supporting critical investigations to advance disease prevention, patient self-management, end-of-life care and treatment innovations, as well as funding training for nurse scientists.

The results of nursing research help build the knowledge base and provide the evidence to guide interventions by nurses and other health care workers. From studying approaches to prevent HIV/AIDS in Jamaican girls, to assessing water filters that could reduce cholera outbreaks in Bangladesh, or identifying how to lessen depression caused by HIV/AIDS, NINR-funded nurse investigators are producing scientific evidence that improves health around the globe.

These advances are particularly important for developing countries, where doctors are scarce and there are many hard-to-reach and underserved populations. Nurses and nurse scientists help fill the gaps, including training essential health care workers. Developing expertise in low-resource settings has never been more critical, since diseases such as Ebola can quickly move from a child in a West African jungle to a nurse in Texas.

"In an increasingly interconnected and mobile world, global health threats such as tuberculosis, SARS, Ebola and influenza, among others, can spread at the speed of a jet plane," NINR Director, Dr. Patricia A. Grady, commented.

*Nurse scientists play a vital role in improving clinical care, especially in developing countries.*



Photo by Victoria A. Smith, courtesy of PhotoShare

"Nursing science is at the forefront of designing programs that promote wellness, prevention and, not coincidentally, lower health care costs."

Rapid advances in technology and genomic science, as well as significant changes in demographics and health care policies and practice, have placed new demands and created opportunities for nursing to find fresh approaches and interventions to improve health. With the increasing prevalence of mobile phones in even the poorest countries, there are new avenues to develop technological tools, such as the lab-on-a-chip (see page 7), and find innovative ways to communicate health information.

NINR has supported studies in more than a dozen developing countries over the past decade in such critical areas as reducing maternal and infant deaths related to childbirth, studying text messaging to improve patient drug adherence to combat tuberculosis, and finding more effective methods to limit the spread of HIV/AIDS. More recently, NINR has begun to address the rising tide of noncommunicable diseases by supporting the development of the research expertise needed among nurses in Thailand and elsewhere.

NINR also invests in global health research training for early-career nurse investigators, in collaboration with Fogarty. For instance, the agency has supported participants in Fogarty's Global Health Program for Fellows and Scholars, which has provided mentored training in HIV/AIDS, tuberculosis and tropical disease research for nurses working in countries such as Argentina, Thailand, Malaysia and India (see related article on page 4).

The seeds of NINR-funded global research are spreading as researchers share discoveries and other developing countries recognize the value of these more effective and economical interventions. For instance, in a South-South collaboration, researchers in Chile are building on an NINR-supported model developed in Botswana and Malawi to mobilize health care workers to drive HIV/AIDS prevention patient education.

In these and similar projects around the world, NINR is working to identify areas in need of research, disseminate scientific findings and form global partnerships to improve the health and well-being of all the world's citizens.

Articles by Cathy Kristiansen

### RESOURCES

<http://bit.ly/nurselinks>, [www.ninr.nih.gov](http://www.ninr.nih.gov)

## Sari cloth can filter cholera from water, research shows

A simple method of using readily available sari cloth to filter pond and river water successfully reduced the incidence of cholera by nearly half in a study conducted in Bangladesh. Funded by the NIH's National Institute of Nursing Research, the findings may have applications in other low-resource settings. More than 1 billion people worldwide lack access to safe drinking water and over 5 million die each year from waterborne illness, according to the WHO.

In many rural areas of Bangladesh, women use surface water for their household since it may be safer than well water, which can contain arsenic. The research team took its cue from a local practice to rid drinking water of insects and leaves by pouring it through sari cloth. Lab tests supported by the Thrasher Research Fund showed that a filter made of four layers of worn cotton material held back more than 99 percent of all cholera bacteria—using more layers or newer cloth slowed water collection too much.

“The filter is unique and useful,” said investigator Dr. Anwar Huq who has collaborated on the project with University of Maryland colleague Dr. Rita Colwell. “It doesn't require any money or sophisticated training and the women bringing water to the house enthusiastically used the filtration, once the benefit was explained to them.”

To test the filter's effectiveness, Huq and his colleagues studied about 45,000 residents, all in households with children under age five, who are typically more vulnerable



Photo courtesy of Dr. Anwar Huq/University of Maryland

A simple method of filtering water through sari cloth can reduce cholera incidence by nearly half.

to cholera. They showed the women how to use sari cloth to filter water that would be consumed or used to clean teeth, food and tableware. They followed up by visiting the village every two weeks to encourage compliance. An additional group of villages served as controls, adopting no interventions. In the households that were filtering water, cholera incidence was about half the level of the control participants and infections arising were milder, the scientists reported in *Proceedings of the National Academy of Sciences*. The study also showed the practice benefited neighbors who did not filter their water, by reducing the overall incidence of cholera in the community.

In a follow-up study five years later, researchers discovered about one-third of participants continued to filter water as trained. Huq suggested repeated training and messages on TV and the radio could improve usage. He added he hopes to investigate if the filter blocks other waterborne pathogens as well, such as *E. coli*.

## Lab-on-a-chip provides speedy disease diagnoses

Co-infection with syphilis or genital herpes can compound the spread of HIV, but these diseases are all treatable—if they are diagnosed. Many global health systems struggle to pay for costly laboratory tests, so researchers have developed a potentially inexpensive, portable diagnostic tool, ideal for remote locations without electricity.

The lab-on-a-chip prototype, mChip, can detect HIV and syphilis in only a few drops of blood from a finger prick. It is powered by a nine-volt battery and takes less than 20 minutes to provide clear-cut results. The NIH's National Institute of Nursing Research and other funders



supported the development and testing of the tool. Dr. Samuel Sia, of Columbia University, led the research.

In Rwanda field studies, mChip detected HIV and syphilis with lab-standard accuracy. Test results from this device can be transmitted by cell signal or satellite to medical records databases.

The researchers plan to continue refining the new tool, for instance by finding ways to reduce its temperature sensitivity and lower its cost to enable widespread availability in developing countries.

In a report in *Nature Medicine*, they suggest the technology could be adjusted to identify markers for other infections such as gonorrhea and Chlamydia as well, leading to treatment and lessening the global burden of sexually transmitted diseases.

# Research aims to curb mental, emotional pain of HIV

The emotional, mental and social consequences of HIV/AIDS are often left untreated in developing countries, where resources are scarce. So, for instance, women experiencing stigma may withdraw from daily chores, children grieving for a parent or sibling can flounder in school, while caregivers may become overwhelmed and fall into depression.

The NIH's National Institute of Nursing Research (NINR) has supported a number of global health studies on these aspects of HIV/AIDS, with researchers assessing the burden and testing low-cost interventions to relieve suffering. These studies also build local capacity by training nurses and health care workers to conduct research and apply findings to improve care. Scientific discoveries made in one country can often be adapted for use elsewhere, guiding worldwide strategies to improve health.

In Thailand, where the UN estimates half a million people are living with HIV/AIDS, NINR has collaborated with the National Institute of Mental Health to fund studies on reducing depression and improving quality of life among people with the virus and their family members. Research has shown this is important not only to lessen misery but also curb another problem in Thailand: concealing an HIV diagnosis, which in turn adds psychological stress, reduces treatment adherence and promotes spread of the disease.

Scientists devised a 13-week program based on Thailand's culture of close-knit families, which teaches coping skills to caregivers and children, and fosters connections with others facing the same issues. Sessions focus on how to mitigate negative emotions linked to HIV/AIDS by, for instance, projecting feeling intensity onto a thermometer illustration, practicing relaxation techniques and, in group sessions, airing negative experiences and discussing possible approaches to manage them. Participants also used role-play to practice revealing an HIV-positive status to relatives and work colleagues.

The team tested the curriculum with 813 participants and then gauged their emotional health for another two

years. The intervention worked best for those with low or no depressive symptoms, the study showed. Based on its overall success, other hospitals in Thailand have begun adopting the program.



*Coping strategies can benefit children experiencing the stress of living with HIV-positive relatives.*

“This study makes a contribution to the current field of family interventions in demonstrating not only the feasibility, but also the efficacy of such a model that has the potential to be adapted to different cultures with a family-oriented tradition,” said co-investigator, Dr. Sung-Jae Lee, of the University of California, Los Angeles.

For more than a decade, NINR has been funding similar research in China. Many projects have focused on children, who can suffer deeply when a family member has HIV. Research on early childhood development has shown that if children in adverse environments build resistance, they fare better then and later in life.

In one NINR-funded study, researchers developed a program that combined peer-group activities, skills training and community advocacy. For instance, a turtle puppet, stickers and feelings chart were used to

help children control aggression. Meanwhile, adults had lessons on positive parenting skills and received individual counseling. Dr. Xiaoming Li, of Wayne State University, and his colleagues are now assessing the intervention's impact.

In another study, Li's team investigated how orphans fare in different types of care environments. Using a trauma symptom checklist, the researchers measured anxiety, depression, anger, post-traumatic stress, dissociation and sexual concerns in orphaned children in rural locations. The results showed community-based group homes had better outcomes than those in AIDS orphanages and especially those in kinship care. Small homes permitted a closer child-caregiver relationship, higher quality of caregiving and less stigmatization. The findings could help inform government programs, the researchers suggest.

Other NINR global studies in this realm of health include a psychosocial intervention targeting Zimbabwean teens with an HIV-positive family member, as well as a project to improve the mental and physical health of women living with HIV/AIDS in rural India.



# Study finds mothers can help reduce daughters' risk of HIV infection

Adolescent girls in Jamaica have more than twice the risk of contracting HIV than other groups, based on a range of social, cultural and economic influences. Studies in the U.S. have shown that enlisting mothers of at-risk girls can reduce their chances of HIV infection. Scientists supported by the National Institute of Nursing Research adapted the approach to see if the same is true in Jamaica.

“We can’t just assume that U.S. findings translate into other countries,” said Dr. Katherine Hutchinson, of Boston College Connell School of Nursing, who led the Jamaica research. “We need to develop interventions that can be effective in the contexts in which people live.” About 1.8 percent of Jamaicans aged 15-49 are HIV-positive, or about 30,000 people, according to UNAIDS.

Several factors contribute to the lack of awareness and empowerment in Jamaican adolescent girls for avoiding HIV risk, Hutchinson said. Sex education is limited in schools. Churches and parents typically promote abstinence, especially for girls, so do not inform them about safe sex. Hutchinson also noted that gender norms fuel the risk, since young men are encouraged to gain sexual experience and often choose girls who can be more easily seduced.

In the study, U.S. and Jamaican scientists enrolled 330 mother-daughter pairs to test their strategy for reducing HIV. A control group received general health information while the study group participated in a two-day session focused on teaching them about HIV risk, the importance of condom use, strategies girls could use to refuse sex or insist on a condom, and how to recognize and avoid situations where coercion could arise. The participants watched videos with Jamaican music and dance moves, role-played and discussed topics such as how to open conversations about sex and communicate well. In one sketch, a mother took her daughter to buy condoms, which in Jamaica involves asking a pharmacist who might balk at supplying a teen girl.

“We found evidence that the whole mother-daughter approach could be effective at changing some of the known mediators of risk,” Hutchinson said. Mother-daughter communication and the mothers’ monitoring increased during the trial and remained higher three and six months later.

Photo by Kathy Straus, courtesy of PhotoShare



Mothers can play a critical role in protecting their daughters from HIV, according to a study supported by the National Institute of Nursing Research.

Helping the mothers develop tools to take action was key, Hutchinson noted. “A lot of mothers haven’t had ideal role models in their own lives and don’t have the knowledge and skills to speak with their daughters about sex. But if you can help people with opening lines for discussion, with strategies on how to talk to their daughters and how to monitor their behavior, that is powerful.”

The study also revealed that the mothers’ own sexual role-modeling can be a critical influence on their daughters’ actions, she added. “How do their mothers behave around men? Do they let themselves get pushed around? Do they bring lots of different men home? The mothers’ own behaviors may be influential, even if they are telling their daughters to abstain,” Hutchinson said.

Aside from testing the intervention, another key aim of the study was to build research capacity in Jamaica. The team included more than eight nursing and medical faculty members at the University of the West Indies, who gained research skills and contributed to scientific papers. Nursing students and practicing nurses were also trained during the study, for instance in data collection and working with enrollees.

At the end of the trial, the team sent the materials to community-based family organizations so they could continue using the videos, handouts, games and materials to educate adolescent girls and mothers about HIV prevention. Hutchinson hopes government policymaker interest in the intervention—in Jamaica and other similar settings—will grow and lead to adoption of the program.

# OPINION

By Dr. Roger I. Glass, Director, Fogarty International Center

## Injuries cause 5 million global deaths each year



At Fogarty, we pride ourselves on determining the gaps in global health research. One such neglected area is trauma and injury research and training.

Every six seconds someone in the world dies as a result of an injury, which adds up to a staggering toll of more than 5 million deaths each year, the WHO reports. That accounts for about 9 percent of global deaths, or nearly 1.7

times the number of fatalities resulting from HIV/AIDS, tuberculosis and malaria combined. Tens of millions more suffer injuries that require treatment and often cause temporary or permanent disabilities.

For the past decade, we've been supporting critical projects that strengthen the capacity of low- and middle-income country (LMIC) institutions to study ways to prevent or respond to road traffic injuries, drowning, agricultural injuries, burns, falls, poisonings, domestic violence and self-harm.

But with such an enormous global burden of trauma and injury, it is imperative that we redouble our efforts to develop expertise and support research where it's needed most. About 90 percent of injury-related deaths occur in LMICs, according to the WHO, with higher rates among poorer citizens who are least able to pay for treatment and suffer most from income loss during their recovery. The poor are at higher risk for injuries because they are faced with hazardous situations on a daily basis. For example, pedestrians on unsafe, overcrowded and badly maintained roads are at greater risk of being hit by cars, buses or other vehicles. People living in poorly constructed homes without safety devices are more susceptible to burns and falls. In addition, many LMICs have inadequate health care and lack infrastructure such as paved roads and emergency response systems.

Despite growing awareness of the scale of the problem, there is little action being taken by policymakers. Since there are proven strategies to reduce trauma and injury, it is essential that we train and support local researchers to study how interventions can best be implemented to suit the local culture and circumstances. That's one of the key

aims of the Fogarty International Collaborative Trauma and Injury Research Training Program.

As we prepare to issue a new call for applications, we have been reviewing our grantees' accomplishments to date. We've also been examining the landscape to see what needs remain unmet and which research questions are unanswered.

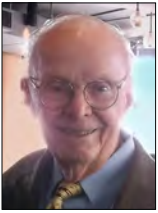
It's encouraging to see the tremendous returns we have received from a relatively modest investment. For example, with 10 years of support to Johns Hopkins University, a cadre of about a dozen faculty and researchers has been trained in trauma and injury in Pakistan. With this expertise, they have spearheaded projects to create software for emergency care data collection at hospitals, methodology to accurately assess trauma and emergency care capacity, and a surveillance system to measure traffic injuries—the largest contributor to this health burden. Meanwhile, a grant to the University of Maryland has supported trauma training throughout the Arab Middle East, providing intensive summer courses and the opportunity for mentored research projects. More than 450 trainees have participated from Egypt, Iraq, Sudan, Libya, the West Bank and Afghanistan, with many going on to leadership positions in national health ministries or health care systems.

In China, a project has supported training for more than 80 mid-level and senior researchers who have studied various risk factors for agricultural injuries related to alcohol consumption, sleep patterns, pesticide exposure and others. The need is great—a recent study of farmers in rural China showed more than 590,000 injury deaths occur annually and about 3.5 million workers are permanently disabled. Clearly, there is much work to be done.

We are grateful to our partners for their continued support in this important work, including the CDC's National Center for Injury Prevention and Control, the WHO, and the NIH Office of Research on Women's Health, Office of Behavioral and Social Sciences Research, National Institute on Alcohol Abuse and Alcoholism, and National Institute of Neurological Disorders and Stroke.

### RESOURCE

Website: <http://bit.ly/injurytrauma>



### Fogarty scientist emeritus, former NIAID chief dies

Dr. Richard Krause, director of the NIH's National Institute of Allergy and Infectious Diseases from 1975 to 1984, has died at age 90. An immune system expert, he was elected to the National Academy of Sciences in 1977. He had been a Fogarty adviser and scientist emeritus since 1989.



### National Library of Medicine's Lindberg to retire

Dr. Donald Lindberg has announced he will retire at the end of March from NIH's National Library of Medicine after 30 years serving as director. He has been a groundbreaking innovator in information technology, artificial intelligence, computer-aided medical diagnosis and electronic health records.



### Former Congressman Holt to lead the AAAS

Former U.S. Congressman Rush D. Holt, who holds a Ph.D. in physics, has been appointed to lead the American Association for the Advancement of Science (AAAS), the world's largest general scientific organization. Holt will be the association's CEO and executive publisher of *Science* journals.



### Former Fogarty adviser Hotez is U.S. science envoy

Former Fogarty Advisory Board member, Dr. Peter Hotez is one of four eminent scientists to be chosen by the U.S. State Department as a science envoy to boost global scientific cooperation. Hotez is professor and dean of Baylor College of Medicine's School of Tropical Medicine and president of the Sabin Vaccine Institute.



### Botswana physician is new WHO Africa director

Dr. Matshidiso Moeti, a longtime veteran of the WHO, was recently selected to be the agency's Regional Director for Africa. Moeti, from Botswana, previously headed the WHO Malawi office and has also served as a WHO regional adviser for women's and adolescent health.



### Abdool Karim receives three awards for research

Fogarty grantee Dr. Quarraisha Abdool Karim, associate director of the Center for the AIDS Program of Research in South Africa (CAPRISA), has been recognized for her groundbreaking HIV/AIDS research. She received the World Academy of Science's TWAS-Lenovo Science Prize and gold medals from the South African Academy of Science and Medical Research Council.



### Fogarty mentor awarded Nigerian honor

Fogarty former trainee and grantee, Dr. Alash'le Abimiku, has received the Order of the Niger for her contributions to enhancing laboratory medicine in Nigeria. She is co-founder of the Laboratory Diagnostics and Research at the Institute of Human Virology, Nigeria, an associate professor at the University of Maryland and mentor to current Fogarty trainees.

### UN reviews lessons from Ebola outbreak

The UN has published a report on the Ebola outbreak, titled "Making a Difference: Global Ebola Response Outlook 2015." The document examines lessons learned from the different stages of the outbreak and suggestions for ways to improve future responses. Full report: <http://bit.ly/EbolaRprt>

### Agencies issue first global violence study

The first-ever status report on global violence prevention has been released by the WHO and the UN. The study details the progress of 133 countries in curbing interpersonal violence and injury, including child, elder and sexual abuse. Full report: <http://bit.ly/WHOinjury>

### WHO provides status report on NCDs

The WHO has issued an update on global progress to combat noncommunicable diseases, providing the latest available estimates on NCD mortality and risk factors. The report also identifies bottlenecks as well as opportunities and priority actions for attaining the nine voluntary global targets. The agency reported NCDs caused 38 million deaths in 2012, three-quarters of them in developing countries. Full report: <http://bit.ly/NCDsUP>

### UN seeks protection of world's children

Millions of the world's children remain marginalized and their welfare should be a priority in the global health agenda, according to the UN children's agency, UNICEF. "The Agenda for Every Child" publication outlines seven priorities that UNICEF says should be addressed in the next global development goals. Website: <http://bit.ly/KidPriority>

### WHO releases global malaria stats

The WHO's annual world malaria report shows 55 countries are on track to reduce their malaria burden by 75 percent, meeting World Health Assembly targets and achieving number 6 of the Millennium Development Goals. The study shows expanded use of diagnostic testing and insecticidal nets in Africa. Full report: <http://bit.ly/2014malaria>

### Artists enlisted to promote vaccines

More than 30 world-renowned artists have been commissioned to create diverse works that depict how vaccines continue to change the course of history. The global effort, titled *The Art of Saving a Life*, is supported by the Bill and Melinda Gates Foundation. Website: [www.artofsavingalife.com](http://www.artofsavingalife.com)

Funding Opportunity Announcement	Details	Deadline
Mobile Health (mHealth): Technology and Outcomes in LMICs (R21)	<a href="http://1.usa.gov/1lwXFY3">http://1.usa.gov/1lwXFY3</a>	Feb 19, 2015
International Research Scientist Development Award (IRSDA) (K01)	<a href="http://bit.ly/IRSDA15">http://bit.ly/IRSDA15</a>	Mar 4, 2015
International Research Ethics Education and Curriculum Development Award (Bioethics) (R25)	<a href="http://bit.ly/Fogbio">http://bit.ly/Fogbio</a>	May 22, 2015
Global Infectious Disease (GID) Research Training Program (D43)	<a href="http://1.usa.gov/1lzFC34">http://1.usa.gov/1lzFC34</a>	July 29, 2015
Fogarty HIV Research Training Program for LMICs (D43) (D71) (G11)	<a href="http://bit.ly/FogHIVD43">http://bit.ly/FogHIVD43</a> <a href="http://bit.ly/FogHIVD71">http://bit.ly/FogHIVD71</a> <a href="http://bit.ly/FogHIVG11">http://bit.ly/FogHIVG11</a>	July 30, 2015 July 30, 2015 July 30, 2015

For more information, visit [www.fic.nih.gov/funding](http://www.fic.nih.gov/funding)

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## Sub-Saharan genomics study gives clues about disease

Clues about medical conditions in sub-Saharan Africa, from hypertension to sickle cell anemia to many other diseases, recently came to light in the first study to comprehensively assess genomic diversity across the region. An international team that included NIH researchers participated in this project.

The team characterized the genomes of about 1,800 people from 18 different ethno-linguistic groups and revealed about 30 million single nucleotide polymorphisms or DNA variations, about a quarter of them new. The study, part of the African Genome Variation Project that is building genomic expertise in Africa, has laid the groundwork for further medical genetic studies of people with sub-Saharan African ancestry, the authors reported in the journal *Nature*.

“The rich genomic diversity in sub-Saharan African populations can offer new insights about disease susceptibility that could easily be overlooked using less-tailored analyses,” said Dr. Dan Kastner, scientific director of the NIH’s National Human Genome Research Institute. “This is an important study that demonstrates how a one-size-fits-all approach is not always best when it comes to population genomics.”

Among the findings was evidence of the influence of other peoples on African DNA. Integral to understanding genomic diseases is tracking population movements over time and deciphering data to show how genomes are shaped by the environment, climate and pathogens, the scientists wrote. Researchers can use the study findings to help design a pan-African genotype test to detect common genetic variation across Africa with more precision than existing arrays designed for Europeans and Asians. “We can have a very good, inexpensive array that can be used for future genome-wide association studies,” said Dr. Fasil Tekola Ayele, co-lead author and NIH researcher. “Having this array would aid African researchers with ongoing genomic studies.”

All data assembled will be freely available to researchers and deposited in the European Genome-phenome Archive and the Pan African Bioinformatics Network for H3Africa.

### RESOURCE

Journal article: <http://bit.ly/SSAgenome>

Photo by Moggie Barlett/ NHGRI

