



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

Fogarty marks decade supporting research fellowships

Over the past 10 years, Fogarty's international clinical research fellowship program has influenced the careers of hundreds of young scientists, sparking their interest in global health by enabling them to conduct hands-on research in developing countries. Many have emerged committed to pursuing global health careers and with initial study results that have formed the basis for fundable grant applications.

Several hundred Fogarty alumni and current participants gathered at NIH recently to celebrate the program's 10-year anniversary. NIH Director Dr. Francis S. Collins joined the festivities and thanked the fellows for their dedication and desire to change the world.

"One of my highest priorities at NIH is to try and encourage health research not just domestically but globally," Collins said. "You are ambassadors making that vision a reality in amazing ways."

Since 2004, nearly 800 early-career U.S. and foreign scientists have received Fogarty fellowships to conduct studies on topics as diverse as surgical capacity in Rwanda, mental health in Indian slums, sexually transmitted diseases in Peru and cervical cancer in Zambia. Through such research collaborations, they have produced scientific discoveries and formed partnerships that may last a lifetime.

The experience can be life-changing, Collins told this year's fellows, adding that his own stint as a volunteer in West Africa altered his entire world view. "You're going to be asked to do things that you probably will feel you're not prepared for, but you are there, being called on," he said. "You'll build a sense of who you are. In particular, you'll build a sense of what the world is about and how much your talents are needed to make the world a better place."

Photo by Bill Bronson/NIH



NIH Director Dr. Francis Collins hears how Fogarty's Scholars and Fellows program encouraged participants to pursue global health research careers.

Fogarty's Global Health Program for Fellows and Scholars provides a year of training and research experience for young investigators at a time when they are still carving out their career plans and can consider a potential pathway that includes research. Participants are from a wide range of fields, including medicine, public health, nursing, dentistry, pharmacy, veterinary medicine and other health sciences.

Research projects, which in the program's early years focused on HIV and other infectious diseases, now include noncommunicable conditions, such as trauma, mental illness, diabetes, cancer and cardiovascular disease. So far, fellows and scholars have conducted research at more than 60 sites in over two dozen countries. The program receives funding and other support from 17 other NIH institutes, Centers and Offices and is administered by a consortium of 20 academic institutions.



Centers for Disease Control and Prevention

- Viewing global health as a priority
- Forming partnerships to avert pandemics
- Providing hands-on scientific training



Photo by Cathy Kristiansen/Fogarty

To encourage more Rwanda-U.S. research collaborations, Minister of Health Dr. Agnes Binagwaho met with NIH Deputy Director Dr. Lawrence Tabak and other senior NIH officials.

Rwandan Health Minister discusses research collaborations with NIH

Rwandan Minister of Health, Dr. Agnes Binagwaho, visited NIH recently to discuss opportunities for research collaborations between the agency and her country, whose population continues to face many health threats from infectious diseases, especially HIV/AIDS and tuberculosis, as well as the growth of noncommunicable diseases.

Quality scientific evidence is vital to facilitate Rwandan health policy changes at the cabinet level, Binagwaho emphasized at a meeting attended by NIH Principal Deputy Director Dr. Lawrence Tabak and more than a dozen other senior Institute and Center officials with a strong interest in global health.

During her NIH visit, organized by Fogarty, Binagwaho also toured the Clinical Center and several labs. While in Washington, she met with global health experts at USAID, nonprofit partners and lawmakers on Capitol Hill.

Binagwaho, a pediatrician and Ph.D. candidate who has led her country's health ministry since 2011, said Rwanda is looking to partner in research capacity building in a wide range of areas, from cancer and mental health to genomics and child health.

In the 1990s, Rwanda had the world's lowest life expectancy—27 years—but staged a remarkable recovery to reach 65 years by 2012. The country's experience with civil war, genocide and rape has left many emotional scars that undermine mental health, as well as a continuing heavy burden from HIV/AIDS and other diseases that erode physical health, Binagwaho noted.

NIH has supported a number of research projects in Rwanda over the past several years, predominantly HIV-related, but Binagwaho said more collaborations would help accelerate the expansion of research capacity and scientific progress. Fogarty grants, for example, support training of Rwandan scientists in bioethics and in the comorbidities of HIV, including cardiovascular disease, diabetes and metabolic conditions. Another project is establishing an East African hub for interdisciplinary research and training in environmental health, planned to include Rwanda.

Other NIH grants focus on how infection spreads, for instance, examining the interaction between HIV and women's genital tracts and the role of estrogen in HIV transmission. Cervical and other cancers are also being studied in Rwanda, while additional projects examine mental health issues tied to living with HIV and protecting the psychological well-being of children suffering from HIV.

Rwanda has made great strides in combating HIV/AIDS, with 90 percent of the country's HIV-positive population on antiretroviral treatment. Disease testing and prevention education are also widely available. In addition, the country reduced malaria incidence by 70 percent between 2005 and 2010 through aggressive distribution of insecticide-treated bed nets and spraying.

Binagwaho highlighted her country's efforts to reduce cervical cancer via the human papilloma virus vaccine. Rwanda was the first African country to introduce the vaccine, immunizing more than 90 percent of school girls nationwide through a donation from Merck, and will continue the effort with support from the nonprofit GAVI Alliance. It is also conducting systematic screening for this malignancy in women ages 35-45.

Many health burdens in Rwanda remain, and Binagwaho emphasized that connections between her country's scientists and NIH will go a long way to building research capacity and producing the scientific evidence that will help promote policy changes to improve the health of all Rwandans.

| Rwanda health stats | |
|---|---------------------------------|
| Population: 11,458,000 | |
| Annual per capita health spending: \$66 | |
| Domestic share of health spending: 47 percent | |
| Life expectancy at birth: 65 years | |
| Under-5 mortality rate: 55 children per 1,000 live births | |
| Per 100,000 people: | |
| Incidence of malaria: 5,414 | Prevalence of HIV: 1,806 |
| Prevalence of TB: 114 | |
| <i>Statistics from the WHO's Rwanda health profile and Health System Financing Country Profile, Rwanda 2012</i> | |

Hope motivates positive behavior in HIV patients

Hope can be a powerful positive force in the lives of people living with HIV, not only on a personal level by encouraging them to plan for the future, but also at a societal level by spurring treatment adherence and thwarting transmission of the virus, according to a Fogarty-funded study in Tanzania.

Although antiretroviral (ARVs) drugs are allowing millions of HIV-positive people to live normal lives, a new diagnosis of HIV can often lead to depression, research has shown, making it less likely some will seek or adhere to treatment regimens.

“Without appropriate interventions to address mental health comorbidities, people living with HIV may continue to have poor quality of life despite increased access to ARVs globally,” the team of scientists wrote in their recently published paper. “Clinic-based HIV counseling support can promote more hope and positive behaviors,” they added.

The researchers investigated how residents of Dar es Salaam who are living with HIV perceive hope and process the information that an HIV diagnosis does not mean immediate death. “This knowledge leads to positive emotions and motivation to seek treatment and cope,” the scientists observed.

Tanzania is one of the countries hardest hit by the HIV epidemic, with about 1.5 million people living with HIV, according to UNAIDS data. But the prevalence is declining, measured at 5.1 percent of the population in 2011-2012, compared with 7.0 percent in 2003-2004.

The qualitative study—published in the *Journal of the International Association of Providers of AIDS Care*—included focus group discussions with 78 people who had been HIV-positive for at least six months and interviews with others who had a recent depression diagnosis or whose hospital records gave depression as the reason for missed clinical visits.

Participants conveyed their experiences of hope in three ways—involving emotions, cognitive approaches, and coping or normalization. They described joy as an emotion of happiness, security and relief. On the cognitive front, hope was equated with positive thoughts of a good future and long life. Meanwhile, on the theme of coping and normalization, hope indicated acceptance of HIV-positive status, and willingness to seek and adhere to medical care and contemplate future plans.

Photo by Virginia Lampech/PhotoShare



Counseling that encourages hope in people living with HIV may improve their adherence to antiretroviral drugs.

Hope levels were high in patients who had been ill and then improved upon taking antiretrovirals, as well as in those who learned that treatment offered the prospect of longevity and a normal lifestyle. One study participant said, “Hope is what lifted me up when I was not sure of continuing with my life anymore.”

The study is part of a research training project supported by a five-year Fogarty grant to Muhimbili University of Health and Allied Sciences, in collaboration with Harvard School of Public Health and other partners. The initiative, now known as the Fogarty HIV Research Training Program, encourages training in low- and middle-income countries in skills needed to conduct clinical research and implementation science, including operations and health services research.

The investigators noted some people living with HIV found it harder to muster a positive attitude, especially those facing social alienation, battling opportunistic infections or suffering side effects from antiretrovirals.

The researchers concluded that helping HIV-positive people develop and maintain hope can be an important aspect of care, not least in reversing poor adherence to treatment and high loss of follow-up. Hope “stimulated inner strength, which acted as a drive to cope and normalize their lives,” the authors wrote. “The findings point to a possibility of positive benefits of promoting aspects of hope among people living with HIV.”

RESOURCE

Paper: <http://bit.ly/hopeHIV>

PROFILE

Fogarty Fellow develops triage tool for children

By Cathy Kristiansen

Fogarty Fellow Dr. Bhakti Hansoti looks at the long, orderly line of parents and their children in the Cape Town clinic and sees something wrong with the picture. Randomly mixed in with children coming for well-visits are the very sick, who will wait for hours until it's their turn for attention.

In South Africa, most primary care clinics—where over half of critically ill children are first tended—have no formal triage system to identify those patients who need to be sent immediately to a hospital for specialized care. One reason is that many youngsters are on their mother's back and a formal assessment would require each child to be unwrapped and undressed upon arrival.

Hansoti, an emergency medicine physician trained at Edinburgh University in the U.K., and now based at Johns Hopkins Hospital, received a Fogarty fellowship to study emergency care in South Africa.

The WHO suggests that improving urgent care in developing countries would substantially lift the burden of death and disability. "Emergency care is a big public health issue, but funding is difficult because it covers many specialties," Hansoti says. "It's everything from disaster response to obstetric crises to urgent care for chronic illnesses."

Hansoti nurtured a deep interest in global health as she worked in clinics in Liberia, China, India, Ghana, Uganda, Jamaica and Nepal. In time, she chose her specialty. "I found I liked undifferentiated patients. I like the buzz and energy that comes with emergency medicine, not knowing what my day would be like."

With the help of her mentor, Dr. Lee A. Wallis, at the University of Cape Town, Hansoti developed a research project based on a previous study at a city hospital that found more than a third of critically unwell children had adverse outcomes due to delayed triage and referral from primary to specialist care. Bhakti adapted the WHO's Integrated Management of Childhood Illness tool



Bhakti Hansoti, M.B.Ch.B., M.P.H.

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|--------------------|--|
| Fogarty Fellow: | 2013-2015 |
| Fellowship at: | University of Cape Town |
| U.S. organization: | Johns Hopkins University |
| Research focus: | Emergency care for children |
| Website: | www.drbhakti.com |

to create a screening method designed for use in primary care facilities in low-resource settings.

The Sick Children Require Emergency Evaluation Now (SCREEN) approach is so straightforward that lay health care workers can be trained to use it in one hour. The tool comprises seven questions posed in the parent's language designed to detect danger signs. The questioner asks, for example, if the child is sick, under two months old, able to lift his head, eat and drink, or has vomited. Hansoti recalls that one mother, quizzed just as the clinic was opening, said her child couldn't eat and was "floppy." Within 10 minutes, the child had been examined by a nurse and started on IV antibiotics and fluids, and then 30 minutes later was in an ambulance going to a hospital.

Hansoti has tested the screening strategy in 10 primary care clinics, measuring its reliability and impact on waiting times for sick and well children. To handle the data and measure the flow of patients, she produced a cellphone application. Currently, about 1 in 10 children on average are flagged for priority care each day. Hansoti is now studying the impact on clinical outcomes. In the meantime, Cape Town's health authorities have decided to fund training and staff so that all primary health care clinics can use SCREEN to evaluate children on arrival.

As she completes her first fellowship year, Hansoti counts among her new skills the ability to design a project, start it, and conduct qualitative work and needs assessments. She says having dedicated time to focus on a single research project is invaluable. "Your thought flow, your work flow doesn't get interrupted and you can really see a project through from start to completion and deal with problems in real time," she says. "A fellowship allows you to pursue your passion. It's been the best time of my life!"

TOM FRIEDEN, M.D., M.P.H.

Dr. Tom Frieden became Director of the U.S. Centers for Disease Control and Prevention (CDC) in June 2009. A physician with training in internal medicine, infectious diseases, public health and epidemiology, he is especially known for expertise in tuberculosis control. As Commissioner of the New York City Health Department from 2002-2009, he directed the city's efforts to reduce smoking, cut trans fats from restaurant menus and establish electronic health records. Frieden received both his medical degree and master's in public health from Columbia University.



Why is the CDC engaged in global health?

Sometimes, people wonder, "Why should we be involved in global health since we have so many challenges here at home?" But we can't keep Americans safe just looking at our own country. We need to make sure that we're not only protecting ourselves from diseases that can spread from elsewhere, but also learning lessons that can be learned elsewhere, sometimes more efficiently and effectively.

We're also promoting stability around the world. We're increasing economic productivity around the world and lifting all boats by having healthier communities. We're promoting the reputation of America. I'll never forget the woman I met in Nigeria who was holding her twin babies in her hands and she said to me, "I'm HIV-positive, but my babies are HIV-negative because of PEPFAR [the President's Emergency Plan for AIDS Relief]. And thank the American people for me."

And ultimately, our work in global health is so important to do because it's the right thing to do, because we're a great country and because for a very small investment, we can make a massive change in the lives of literally billions of people.

What global threats concern you?

We face a real storm of vulnerability. There are new risks from new infections like H7N9 influenza. There are resistant organisms, and we're now seeing some microbes that are resistant to all our treatments. And, unfortunately, there is the possibility of the spread of intentionally created organisms either through a bioterrorist attack or through the inadvertent release of organisms. With our globalized world, a threat anywhere is a threat everywhere. If there is the emergence of a disease in any part of the world, it could be in any other part of the world within a day.

What can be done?

Pathogens cross borders effectively, and that's why we need to improve further on our support and partnership with the World Health Organization and with countries around the world to better find, stop and prevent threats to health. That will make for a safer United States and a safer world, because we really are interconnected.

In order to do more in terms of finding, stopping and preventing diseases, we need some core capacities to increase the ability of governments and society to recognize, respond and bounce back, to increase resilience. For detection, we need laboratory networks. For response, we need effective emergency operation centers that can scramble in real time and marshal people who can create a rapid response team and stop an outbreak. And for prevention, we need to be able to get high levels of vaccination and respond to outbreaks effectively to stop them and prevent other threats to health from emerging. Unfortunately, the vast majority of the world does not yet have these capacities fully developed, but fortunately there is a global commitment to do so.

How do partnerships make the world safer?

The ability of public health to find and stop outbreaks is in everyone's best interest. China's story of H7N9 collaboration is a great example of that. Ten years ago, when SARS emerged in China, they did not handle it well. It cost the world \$30 billion to deal with SARS. And when H7N9 came about, we then had 10 years of collaboration with the Chinese public health authorities to build on; 10 years of trust, 10 years of capacity building. And from the first hours after they identified the organism, they have been absolutely transparent. They have posted that organism's genome onto the Internet. That allowed us to download it and make a diagnostic test, which we've sent out to every state, dozens of countries and used for any patient with suspected H7N9 influenza.

With that genome, we were able to begin to make a vaccine, to make seed strains, to identify challenges in making that vaccine and address those challenges. Now, what we hope will be an effective vaccine is entering clinical trials. That's the harvest of 10 years of collaboration, 10 years of working together that allowed us to help the Chinese know how to diagnose flu, know how to set up a monitoring network and know how to sequence the genome.

That kind of collaboration protects all of us.

RESOURCE

Website: www.cdc.gov/about/cdcdirector

This feature was adapted from Dr. Frieden's recent media briefings.

Global leaders raise alarm on antibiotic resistance

Poor diagnostic tools, inappropriate use of antibiotics and a lack of new replacement drugs are causing a global crisis of antimicrobial resistance, according to global health leaders.

“A post-antibiotic era—in which common infections and minor injuries can kill—far from being an apocalyptic fantasy, is instead a very real possibility in the 21st century,” warned WHO’s Assistant Director-General for Health Security Dr. Keiji Fukuda. The WHO recently issued its first-ever global report on antibiotic resistance, deeming it a serious, worldwide threat to public health.

“Unless we take significant actions to improve efforts to prevent infections and also change how we produce, prescribe and use antibiotics, the world will lose more and more of these global public health goods and the implications will be devastating,” according to Fukuda.

At the NIH, experts said researchers play a critical role in the unending battle against antimicrobial resistance. In March, the National Institute of Allergy and Infectious Diseases (NIAID) published a report concerning the threat, laying out its strategy to refocus its research efforts to address key scientific challenges. Under the plan, NIAID will examine the comprehensive biology and genetic makeup of specific microbes to understand how bacteria become resistant and will also identify new targets for point-of-care diagnostics. In addition, it will develop vaccines to prevent infection with drug-resistant microbes and design new antibiotics, among other priorities.

Global health authorities, alarmed about the spread of antibiotic resistance, are urging more surveillance, and development of new diagnostics and drugs.

“As long as antibiotics are used to kill bacteria, resistance will continue to emerge,” the NIAID report noted, and as this resistance builds, scientists are in a race to ‘outsmart’ the bacteria by working around the mechanisms that cause resistance.

In a related commentary in the *Journal of the American Medical Association*, NIAID Director Dr. Anthony S. Fauci and colleague Dr. Hilary D. Marston called antibiotic resistance “a global crisis.” They urged colleagues around the world to act on many fronts at once, especially in developing countries, where “the challenges are compounded by limited capacity for surveillance and poorly regulated sales.”

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— WHO’S DR. KEIJI FUKUDA

Global antibiotic consumption increased by an astonishing 36 percent between 2000 and 2010, according to a recent article published in *The Lancet*. Dr. Ramanan Laxminarayan and colleagues found much of the growth occurred in low- and middle-income countries where “antibiotics are used as a substitute for public health measures,” and over-the-counter sales are unregulated.

Health authorities must promote more judicious use of antibiotics and develop new infection prevention measures, according to the NIAID report.

This necessarily involves collaborations among partners from different disciplines and swiftness in identifying and acting on threats as they emerge. NIAID noted, “Because antibiotic resistance is a complex problem with many drivers, combating it requires a multifaceted approach.”

Other scientists are more focused on developing tools to properly identify bacterial infections and prevent their spread in the first place. As Fauci and Marston noted, “The importance of accurate diagnostics at point-of-care in efforts to thwart antimicrobial resistance cannot be overstated.” These tools can help expand surveillance and curb inappropriate antibiotic use, for instance by distinguishing between viral and bacterial causes of respiratory illnesses—the majority of which are viral but are often incorrectly treated with antibiotics.

Photo by Gareth Bentley/SCMS, courtesy of PhotoShore



Meanwhile, two prominent scientists in the U.K. are calling for a new world organization to fight antimicrobial resistance on a similar scale to the U.N. Intergovernmental Panel on Climate Change. In a recent editorial in *Nature*, Wellcome Trust Director Dr. Jeremy Farrar and University of Edinburgh's Professor Mark Woolhouse suggested the new group could marshal evidence and catalyze policy across governments and stakeholders. Antimicrobial resistance resembles climate change in that both operate on a global scale for which humans are responsible and the practices of one country affect many others, the authors observed.

"We need a new independent body that will not only monitor the spread of antimicrobial resistance, but also drive and direct efforts to contain it," said Farrar.

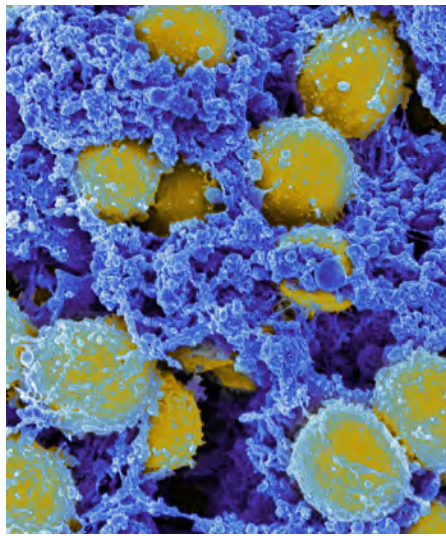
Some encouraging changes are already underway in the bacteria battle, Fauci and Marston noted in their recent article. Industry incentives, such as longer market exclusivity, are encouraging drug development and currently 14 novel antibacterial agents are being tested for their effectiveness in humans. Meanwhile, hospitals around the world are devising systems to prevent patients developing opportunistic infections during their stay.

The NIAID continues to fund research to add to the arsenal available to combat harmful bacteria. In one project, a potential novel class of antibiotics targeting resistant *Staphylococcus aureus* is now in a trial to test its safety. A new \$12 million NIAID initiative aims to develop new diagnostics that can quickly detect the resistant bacteria commonly found in hospitals. Other potential tacks for stopping harmful bacteria include creating vaccines, enlisting harmless bacteria already in the microbiome to bolster the body's defenses and spurring monoclonal antibodies that attack bacterial proteins.

In the U.S., a recent assessment of antibiotic resistance by the CDC found more than two million people each year get infections that are resistant to antibiotics and at least 23,000 people die as a result. The report classified the threats posed by the antibiotic-resistant germs. Deemed most urgent were drug-resistant gonorrhea, carbapenem-resistant Enterobacteriaceae, and *Clostridium difficile*, a serious diarrheal infection usually associated with antibiotic use. *C. difficile* alone causes about 250,000 hospitalizations and at least 14,000 deaths in the U.S. every year.

"The bottom line is that we have to protect patients by protecting antibiotics," said CDC Director Dr. Tom Frieden. "The drugs we have today are endangered. And

Photo courtesy of NIAID



Scientists are concerned that deadly bacteria, such as staph, might become resistant to antibiotics.

any new drugs we get could be lost just as quickly if we don't improve the way we prescribe and use them."

In its analysis of antimicrobial resistance data from 114 countries, the WHO emphasized that every part of the world is affected and a coordinated response is

imperative. The study found resistance across many different types of infectious pathogens, but focused on antibiotic resistance in nine different bacteria responsible for common, serious diseases. These include bloodstream infections (sepsis), diarrhea, pneumonia, urinary tract infections and gonorrhea. It's of "high concern" that bacteria have developed some resistance to all—including last-resort—antibiotics in every region of the world, the report said. Aside from the risk of serious illness and death, resistance also burdens health system budgets, with lengthier hospital stays and more intensive care needs.

"The bottom line is that we have to protect patients by protecting antibiotics. The drugs we have today are endangered."

—CDC DIRECTOR DR. TOM FRIEDEN

At a recent meeting of the WHO's General Assembly, delegates urged member countries to strengthen their antimicrobial drug management systems, support research to prolong the lifespan of current antibiotics, and spur new diagnostics and treatments for microbial infections. The WHO is now preparing a draft global action plan against antimicrobial resistance to be voted on in 2015.

"This serious threat is no longer a prediction for the future," the WHO report noted. "It is happening right now in every region of the world and has the potential to affect anyone, of any age, in any country."

RESOURCES

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

CDC views global health as a key priority

Globalization, the rise of foreign travel, an increased risk of bioterrorism and other developments have spurred the U.S. Centers for Disease Control and Prevention (CDC) to evolve into an international global health leader. For nearly 70 years, the CDC has nurtured partnerships around the world to protect and improve health by strengthening disease surveillance, implementing evidence-based policies and providing training to build vital health capacity in low-resource settings.

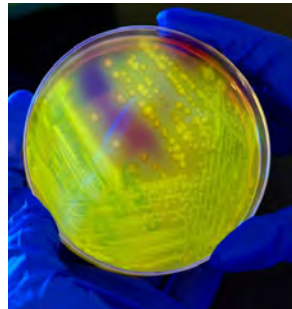
“The health security of the United States is only as strong as the health security of all nations around the world,” said CDC Director Dr. Tom Frieden. “We are all connected by the food we eat, the water we drink and air we breathe. Stopping outbreaks where they start is the most effective and least costly way to prevent disease and save lives at home and abroad—and it’s the right thing to do.”

He noted that the CDC and its partners responded to more than 250 disease outbreaks in 2013, adding, “No single country can deal with these health threats alone. Cooperation between countries has tremendous impact in early detection.”

The agency, based in Atlanta, Ga., has deployed more than 300 public health professionals overseas, in addition to about 1,300 locally employed staff who work in some 60 countries. Many are embedded in national health ministries or with the WHO, where they provide advice and

Epidemiologists trained through CDC programs collaborate to identify outbreaks of diseases, which can rapidly spread around the world.

technical assistance. In addition, hundreds of staff are sent from headquarters each year, as needed to provide temporary help.



The CDC has four primary goals for its global health agenda—to improve health and well-being around the world, respond to potential security threats such as the Ebola and influenza viruses, build countries’ public health workforce and laboratory capacity, and maximize the impact of its own global programs.

“Stopping outbreaks where they start is the most effective and least costly way to prevent disease and save lives at home and abroad.”

— DR. TOM FRIEDEN, CDC DIRECTOR

Technical rigor and a commitment to science and evidence provide the foundation for CDC’s global engagement. Also integral to the agency’s global health efforts are partnerships, primarily with health ministries and UN entities—especially the WHO and child-focused UNICEF—and with NGOs, health institutions, multilaterals, universities and the private sector.

The CDC has worked with countries to build laboratory networks, improve surveillance capabilities, create health information systems, develop service delivery models and strengthen workforce capacity. Once established, this infrastructure can be leveraged by the CDC and other organizations—such as the President’s Emergency Plan for AIDS Relief (PEPFAR)—to further improve public health.

Over time, the expansion of countries’ capacity to implement and evaluate their own public health activities lessens the need for direct U.S. support and increases country ownership and sustainability of public health programs.



Photos courtesy of CDC Global Health

CDC programs improve global health security

Pathogens, toxins and bioterrorism are potential threats to global health security and the CDC is working with collaborators worldwide to guard against these foes. The aim is to provide the expertise and tools to prevent outbreaks in the first instance, and the capacity to quickly detect and respond to any that do erupt to limit their spread and impact.

In two new projects, CDC experts collaborated with health ministries in Uganda and Vietnam to update their infrastructure and systems, enhancing their countries' ability to tackle health threats. The main goals were to modernize diagnostic testing for high-risk pathogens, develop real-time information systems for faster outbreak response, and improve emergency operations procedures, such as steps for safely packaging and transporting specimens.

The CDC selected these two countries because of their unique health challenges. Uganda has a history of dealing with often-fatal diseases such as Ebola, Marburg, cholera and multidrug-resistant tuberculosis, whereas Vietnam has experienced bird flu outbreaks and Severe Acute Respiratory Syndrome (SARS).

"Their success at rapidly adding new disease detection and response skills suggests that similar efforts could work for other countries," said CDC Director for Global Health, Dr. Tom Kenyon. "This is important in a world that regularly sees new pathogens."



Photo by Niki Pham/CDC Vietnam
Lab workers in Vietnam run diagnostic tests.

Hands-on CDC training boosts researcher skills

Integral to the CDC's progress in protecting and promoting health globally are the research professionals in other countries who are qualified to monitor local disease activity. To help train these experts, the CDC has launched programs in 69 countries that have produced more than 2,800 graduates—a large portion of whom hold government posts in their home countries. Many are in leadership positions such as national epidemiology directors or regional surveillance department heads.

The CDC's major initiative for helping health ministries build their own training and capacity is called the Field Epidemiology Training Program (FETP). Its sister program, the FELTP, includes either a laboratory management specialty or other focus such as noncommunicable

CDC training programs have expanded the global network of epidemiologists able to detect and respond to outbreaks.



Photo by Dr. Kayla Laseason/CDC

diseases or veterinary medicine. Each program is tailored to meet a country's particular health needs based on its culture, national priorities, established relationships and existing public health infrastructure.

FETPs provide two-year, full-time training opportunities in applied epidemiology. Participants follow residency programs

similar to those established for medical students in hospitals around the world, based on learning through doing. Trainees spend a quarter of their time in the classroom and the rest in the field conducting disease surveillance, outbreak response, system evaluation and other activities.

For example, in Mozambique, trainees were on hand to watch for disease occurrence when severe flooding struck in 2013. In Guatemala, another program is training participants to study bats, which are common vectors for various diseases affecting humans. Non-communicable conditions also benefit from CDC-supported training efforts. In Kenya, a program is investigating the prevalence and causes of neural tube birth defects. Study results were so compelling, the Kenyan government adopted a policy to fortify foods with folic acid—a nutrient that reduces the risk of these types of birth anomalies.

In addition to its routine health strengthening activities, CDC provides emergency support for outbreak detection and response. For instance, when cholera erupted in Haiti in 2010, the agency rapidly responded, setting up a cholera laboratory within 48 hours of the first diagnosis. It also deployed expert medical and epidemiology assistance from the agency's offices in Atlanta and Guatemala to assist Haiti's health ministry. The local FETP trainees and graduates also played an essential role in the response, adding their expertise and local knowledge.

RESOURCES

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

OPINION

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

Celebrating a decade of Fogarty fellows

As we mark the 10th anniversary of Fogarty's efforts to encourage medical students and young scientists to pursue a career in global health, it's a useful time for reflection. What started as a small program that sent about 20 medical students a year to a developing country for hands-on research experience has now blossomed beyond our wildest dreams.

This year, more than 80 U.S. and foreign fellows will carry out research projects in 24 low- and middle-income countries (LMICs). The initial group largely had experience in infectious diseases and joined research projects focused primarily on HIV/AIDS, malaria or tuberculosis. Now our participants run the gamut from geneticists to infectious disease docs, and from diabetologists to bioengineers.

Originally supported by a single private donation, we now enjoy funding partnerships with 17 NIH Institutes, Centers and Offices, which support worthy candidates targeting research in their areas of interest. There is broad recognition of the importance of helping us to bridge the gap between doctoral work and a solid career pathway in global health research.

The response has been extraordinary and we were delighted to expand the program a few years ago to include Fulbright and Doris Duke Foundation fellows, who join us for the weeklong orientation on the NIH campus. All the fellows have the opportunity to hear about cutting-edge work from top scientists, informally interact with NIH leaders and network with each other.

It is gratifying to see how much enthusiasm exists at all levels of training, and the growing recognition of the diversity of diseases now of global importance. I have been delighted to watch our progress—sending Malawi its first-ever pediatric cardiologist, cultivating a rheumatologist studying the link between breast cancer and osteoporosis in China and even engaging several veterinarians to study diseases that affect both humans and animals.



Photo by Bill Branson/NIH

Many of our alumni credit their career shift to participation in this program and tell us this early exposure to global health research has inspired them to go further. A growing number have built on their early study results obtained as fellows to cultivate further funding to continue this important work.

Now, after 10 years, we can see that many who began in the initial cohort are now independent investigators, working in their fields at top research institutions where they keep an eye firmly on global health topics. Some alumni are now engaged in mentoring the next generation of fellows. Others have gone on to establish departments of obstetrics, infectious disease, cardiology or other specialties in LMIC institutions.

“This program has a powerful ability to channel the dreams and capture the imagination and aspirations of these young, idealistic students. It provides physicians and postdocs an alternative path for those who are seeking a meaningful and rewarding career in global health.”

Our Fogarty fellows have done such amazing things, I am always astounded when I have a chance to meet them and witness their poster presentations. This program has a powerful ability to channel the dreams and capture the imagination and aspirations of these young, idealistic students. It provides physicians and postdocs an alternative path for those who are seeking a meaningful and rewarding career in global health.

By seeding the next generation of global health leaders, we ensure we will have the capacity—at home and abroad—to tackle the complex challenges required to improve health for all people.

RESOURCE

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



Burwell is the new US Secretary of Health

Sylvia M. Burwell has been sworn in as the new Secretary of the U.S. Department of Health and Human Services (HHS), the parent agency of NIH. Burwell was most recently the Director of the Office of Management and Budget. Burwell has had significant experience in the global arena. She spent a decade at the Bill and Melinda Gates Foundation, including as the founding president of its Global Development Program which awarded \$1.5 billion annually. Before that, she held positions at economics-related agencies during the Clinton Administration.



NEI's Sieving is honored by German academy

The NIH's National Eye Institute Director, Dr. Paul Sieving, has been elected to the German Academy of Sciences. The Leopoldina, as it is commonly known, is equivalent to the U.S. National Academy of Sciences, providing analyses on important issues from scientific and medical perspectives. About a quarter of its 1,500 members are from countries other than Germany, Austria and Switzerland. Post notable names have included Charles Darwin, Albert Einstein and Max Planck.



NIH scientist is recognized by Spain

A National Institute on Drug Abuse (NIDA) scientist has received a Gold Pin Award from the Spanish Scientific Society of Alcohol and Drugs, its highest honor. Dr. Ivan Montoya, a division deputy director at NIDA, was recognized for his efforts in promoting drug abuse research in Spain and supporting training for investigators and treatment professionals.



Córdoba leads US science foundation

Dr. France A. Córdoba has been appointed director of the U.S. National Science Foundation. An astrophysicist, researcher and university administrator, Córdoba most recently held positions on the boards of the Smithsonian Institution and Mayo Clinic. Before that, she served in leadership roles at Purdue University and the University of California, Riverside. In the 1990s, she was NASA's chief scientist.



Fogarty Grantee Pape honored by Haitian President

Dr. Jean William Pape, Fogarty grantee and director of the organization GHESKIO, was recognized by Haitian President Michel Martelly in a World Health Day ceremony at the National Palace, for his commitment to HIV/AIDS and tuberculosis and his positive impact on the population's health. GHESKIO researchers have made many lifesaving discoveries since 1983, for instance, showing that blood banks were contaminated by HIV, that sexually transmitted diseases increased HIV transmission and that HIV-positive patients could avert tuberculosis by taking prophylaxis medication.

NIH plans bold brain research agenda

The NIH is embracing a new bold scientific vision for brain research, recommended by an advisory committee. Under the 12-year Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, NIH will seek to map brain circuits, measure fluctuating patterns of electrical and chemical activity within those circuits and study how their interplay creates unique cognitive and behavioral capabilities. It is estimated the initiative will cost \$4.5 billion.

Report: <http://bit.ly/brainplan>

USAID marks 50 years of global health

USAID has published a book describing its accomplishments in improving global health over the past five decades, including reducing deaths from diarrhea, malaria, HIV/AIDS and maternal complications. "50 Years of Global Health: Saving Lives and Building Future," is a record of the agency's achievements and a catalog of lessons learned.

Book: <http://bit.ly/USAID-50>

Midwifery study shows urgent need

Properly trained and supported midwives could potentially reduce maternal and newborn deaths by two-thirds, according to a study released recently by the U.N. Population Fund. "The State of the World's Midwifery" report details the vast shortage of midwives in 73 developing countries and estimates investments in midwifery training could yield a 1,600 percent return on investment.

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

EU overhauls clinical trial legislation

Legislation recently passed by the European Union will make clinical trials cheaper and more transparent, the EU said. Researchers need apply only once for trials running in several countries and all results must be published. Low-risk trials may sidestep some regulations.

Press release: <http://bit.ly/EUcltrial>

African nations committing to research

A growing number of sub-Saharan African countries are funding science and technology research in a meaningful way, according to a study of 17 nations conducted by the Centre for Research on Evaluation, Science and Technology at Stellenbosch University. There is a wide range and diversity of science funding configurations across the region, the report noted.

Full report: <http://bit.ly/RD-17>

Funding Opportunities

| Funding Opportunity Announcement | Details | Deadline |
|---|---|--------------|
| Fullbright-Fogarty Fellows and Scholars in Public Health Fellowships for medical or graduate students | http://1.usa.gov/PNTLxU | Oct 14, 2014 |
| Mobile Health (mHealth): Technology and Outcomes in LMICs (R21) | http://1.usa.gov/1lwXFY3 | Feb 19, 2015 |
| International Research Scientist Development Award (IRSDA) (K01) | http://bit.ly/IRSDA15 | Mar 4, 2015 |
| International Research Ethics Education and Curriculum Development Award (Bioethics) (R25) | http://bit.ly/Fogbio | May 22, 2015 |

For more information, visit www.fic.nih.gov/funding

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Chikungunya disease is spreading in Americas

A painful mosquito-borne virus, known as chikungunya, is spreading rapidly throughout the Caribbean and cases have now been identified in several U.S. states, Mexico, Venezuela and elsewhere in the Western Hemisphere. There is no cure or treatment for the illness, which is rarely fatal but causes headaches, a burning fever, rash and joint pain that can last for months or even years, keeping people from going about their normal lives.

Photo by James Gathany/CDC



NIH is working to find a vaccine for chikungunya, a mosquito-transmitted infection spreading in the Americas.

Chikungunya, first identified in Tanzania in the 1950s, is transmitted by the same mosquitoes that spread dengue fever: the *Aedes aegypti* and *Aedes albopictus* species. The first infection in the Western Hemisphere was identified in St. Martin in December 2013. Since then, the debilitating virus has struck more than a quarter of a million people, primarily in the Caribbean, with Haiti and the Dominican Republic being particularly hard hit. Most infections outside the region have occurred during travel, but U.S. health authorities recently reported local transmission in Florida.

Disease surveillance and the advance warning it provides for preventive action is especially important in light of the lack of treatment. The NIH's National Institute of Allergy and Infectious Diseases is testing a vaccine candidate in humans that previously was proved safe and effective in mice. For now, the only relief for those infected is pain medication and fluid replacement for dehydration. People in areas where the infection is spreading are being encouraged to use window screens and mosquito repellent to avoid insect bites.

RESOURCE Website: www.cdc.gov/chikungunya