

Former Fogarty trainee
examines nanomedicines
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Women advocate for leadership roles in global health

By Susan Scutti

Three days in the company of scientific trailblazers at the annual Women Leaders in Global Health Conference demonstrated, once again, that the personal is political. Her early 30s marked the moment when Dr. Soumya Swaminathan, the WHO's chief scientist, said she entered "the culture of the male-dominated committee room" where older, male scientists patronized her and belittled her ideas. She faced this challenge with support from a male mentor who advised her to speak up: "They will grow to respect you and listen to you." Now that Swaminathan's voice is heard around the world, she remains committed to exposing lingering biases of previous generations. "It's still more difficult for women to get their grants approved than men, everything else being equal," said the former Fogarty trainee, citing a recent study. "Women also have more difficulty getting their research published." . . . *continued on p. 2*

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Women scientists gathered recently for a virtual conference to discuss ways to nurture female leaders and achieve gender equity in global health research.

NIH helps LMIC institutions combat sexual harassment

In an ongoing effort to reduce sexual harassment in science, Fogarty has awarded funds to 10 low- and middle-income country (LMIC) institutions to shore up relevant policies, conduct training sessions and create awareness of the processes to report sexual harassment. The NIH Office of AIDS Research provided funds for the one-year awards.

"We realize sexual harassment is a widespread and pervasive problem," said Fogarty Director Dr. Roger I. Glass. "We've seen that many women enter the research pipeline but don't reach leadership positions. A number have reported having to change their careers due to harassment, which is a devastating experience for them and a loss for science."

During a recent virtual network meeting hosted by Fogarty, awardees discussed how their institutions are dealing with

the problem and shared strategies on how to make improvements. Although grantees reported most organizations have anti-harassment policies in place, many said they were not well publicized, and reporting processes and follow up procedures were not clearly defined. The conversation was intended to encourage collaboration in developing models to combat harassment that can be shared broadly.

NIH grantees are all required to provide a harassment-free work environment and are subject to the same terms and conditions wherever they are located, said NIH Associate Director for Science Policy Dr. Carrie Wolinetz. She cautioned the group that "policies can only take you so far," and suggested they must be combined with communication, training and rigorous reporting—which require a firm commitment at all levels of an organization.

FOCUS



One Health research: a holistic approach to improving health

- Researchers study zoonotic diseases among Mongolian herders
- Livestock contact poses danger of human illness in Tanzania
- Efforts to boost agriculture increase risk of parasites in Senegal

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Women advocate for leadership roles in global health



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Hosted by WomenLift Health, the virtual symposium showcased women scientists in leadership roles in Asia and Africa. While many sessions highlighted the value of women in global health efforts, panelists also shared evidence of the gaps and barriers to gender equity in scientific institutions, including unequal pay and underrepresentation. Personal experiences, expert suggestions and hopeful ruminations entertained rapt attendees across the globe during the three-day online stream.

More than listening is required to achieve pay equity and gender parity, said Dr. Michele Barry, director of Stanford Global Health and founder of WomenLift Health. “The best way to advocate for change is through collective voice,” according to the longtime Fogarty grantee. Barry recalled her younger self joining women scientists at Yale who brought “our petition and bill of rights to the institutional leadership and they actually listened and began to correct salaries and track demographics.” Becoming a leader is another way to effect institutional change, said Barry, who cited Dr. Glenda Gray, head of the South African Medical Research Council as an example. Aware that men predominated in the extramural research units, Gray gated men from applying until gender parity was achieved, said Barry.

No matter how it’s accomplished, real change often requires passing new laws, which is a slow process and “often a long fight,” said Professor Agnes Binagwaho of Rwanda’s University of Global Health Equity. “We need to do an annual gender equity audit, where men are part of the exercise.” Such inventories provide hard evidence showing where parity has not yet been reached and where attention needs to be paid, said Rwanda’s former health minister.

Although all scientists face adversaries who seek to “pull you down, dismiss you in some way, shape or form,” Wellcome Trust scientist Dr. Gagandeep Kang said she believes it happens more to women than men. Early in her career, the former Fogarty grantee recalled doing her best to dodge slights. Avoidance, though, “exerts an emotional tax on you,” so over time, Kang decided to assert herself. “You have to speak up, otherwise you’re complicit in continuing the problem.” Acknowledging that “sometimes it’s not gone so well, where I’ve become persona non grata,” Kang believes her true value remains visible: “Ultimately, you’re standing on your science.”

Decision-making is still very much the preserve of men, acknowledged African Academy of Sciences Director Dr. Tom Kariuki. Of the academy’s 500 fellows, only 100 are women. In a recent survey of women scientists across Africa, the majority reported difficulty advancing in their

careers, he said. Conscious and unconscious biases, including the assumption that women will stop work once pregnant, play a role in disparities, said Kariuki. Yet, he is hopeful. “We have a burgeoning pipeline of young scientific women who are looking to join this new ecosystem that we are trying to develop on the continent.” To effect change, he believes African institutions must become “very intentional about where we want to arrive.” For example, he said they must set a goal of “50-50 parity in recruitment” while establishing policies that address bullying and harassment.

When enough women leaders occupy decision-making roles, the very structure of jobs will change, Kang observed. She, herself, has watched countless women subordinates “get married, have babies, take time off, but when their children are in school and they come back, they are way more productive than many men,” she said. “If you take it over a timescale of an entire career, there is no question that a woman will deliver.”

Supporting women begins at home, said Dr. Quaraisha Abdool Karim of Columbia University. “Both my husband and I are scientists. It is because we have shared parental responsibilities that we have flourished.” She acknowledged the debt she owed her parents and teachers, adding that “early foundational work makes all the difference” for women scientists. Still she believes there will always be “more people dissuading you from your dreams than actually supporting you, so you have to look really hard to find those few people who are going to support you no matter what.” Support, including mentoring, is necessary if women scientists are going to use their talents successfully, the conference panelists agreed. A good mentor “helps you navigate the waters” and brainstorms about overcoming personal as well as professional barriers to success, said Barry. “When you’re a mentor you try to help your mentee find clarity.”

COVID-19 has made achieving gender equality even more difficult with women bearing the brunt of the social and economic fallout, noted Amie Batson, executive director of WomenLift Health. As the world rebuilds, she said the global health community needs to rethink how to more effectively deliver health care, which will depend on equitable representation of women in leadership. Leaders draw on their experiences, noted Batson. “When you don’t have diversity, you’re not drawing on the diversity of lived experiences that women bring.”

WomenLift Health, sponsored by the Bill and Melinda Gates Foundation, grew from an annual conference begun in 2017.

RESOURCES

<https://bit.ly/wlgh-2020>

NIH studies global-to-local solutions for HIV stigma

Stigma remains an enormous barrier to controlling the HIV/AIDS epidemic in many parts of Africa, as well as in underserved areas of the U.S. A number of successful interventions developed in Africa and tailored for use in the U.S. were discussed during a recent webinar hosted by Fogarty and the NIH Office of Behavioral and Social Sciences Research.

This global-to-local approach will be explored in a series of webinars to share lessons learned on a variety of topics. “Our goal is to encourage both funders and researchers to give serious consideration into how global health research findings could be adapted for use in the U.S.,” according to Fogarty senior scientist Dr. Linda Kupfer. “Although global-to-local research transfer is not new, we hope to investigate this topic somewhat differently by focusing on the type of research methods that have been used successfully.”

There are similar barriers for access to health care among those living in Eldoret, Kenya and Austin, Texas, observed Dr. William Tierney, who has conducted research in both locations. Poverty, lack of transportation and unreliable cellphone communication all pose significant challenges in both populations, which makes combatting the HIV/AIDS epidemic difficult.

“If you want to break the back of the HIV epidemic you have to get out into the community,” noted Tierney, a former Fogarty grantee and professor at the University of Texas at Austin. A successful program that conducted home visits for 2 million Kenyans—providing testing for HIV, pregnancy and blood glucose levels—was adapted for use in a low-income neighborhood in Austin. The initiative also helps clients navigate the health care system and provides referrals to food banks and other community resources.

Given that AIDS is the leading cause of death for African American women aged 25-34, researchers at the University of Washington (UW) studied how they could reduce HIV stigma to better meet the needs of this population. They found solutions in a toolkit developed by the International Center for Research on Women that was successfully used in Africa, according to UW’s Dr. Deepa Rao. The resource provides materials for a variety of flexible approaches to spur conversations including warm-up games, case studies, role playing and other exercises. In NIH-funded pilot testing, the program was found to be feasible and acceptable in U.S. communities. Videos designed to trigger difficult conversations were added and found to be effective. The program was also adjusted for use in men.

Researchers at the University of Alabama at Birmingham (UAB) also used components of the Africa toolkit in their



A number of interventions to reduce HIV stigma in Africa have been adapted for use in the U.S., including this health fair in Seattle that increased HIV testing in an African immigrant community by 50%.

efforts to reduce HIV stigma locally. “Stigma experiences have many commonalities at their core across the globe,” observed UAB’s Dr. Janet Turan. She and her team added a module on intersectional stigma, encouraging program participants to explore identity issues related to race, poverty, religion and sexual orientation. “Everybody has a story to share on that and it’s a very powerful exercise,” said Turan. With proof of concept from their successful pilot, they are now scaling up in Alabama and Tennessee as well as using Fogarty funding to adapt the intervention for use in the Dominican Republic.

Finally, another UW team used a community health fair approach to increase screening for HIV and other diseases among African immigrant communities in the Seattle area. African-born individuals account for 2% of population but receive 10% of the county’s new HIV diagnoses. Given immigration sensitivities, it was not feasible to go door-to-door, so mini-health fairs were held in residential complexes to provide screening for HIV, hypertension, diabetes, cholesterol and obesity, in addition to providing dental care and other services. The result was a 50% uptake in HIV testing, according to UW’s Dr. Rena Patel.

Fogarty is interested in continuing to collect case studies of global-to-local transfer of innovations and interventions. Please send submissions to arianne.malekzadeh@nih.gov.

RESOURCES

<https://bit.ly/global2local-hiv-stigma>

PROFILE

Fogarty Fellow studied surgical quality in Mozambique

By Susan Scutti

Although non-traditional 'surgeons' perform 40% of operations in Mozambique, the mortality rate is comparable to other regions in Southern Africa, according to a study conducted by Fogarty Fellow Dr. Matchecane Cossa. With only one surgeon for about every one million people in Mozambique, nurse technicians are essential. "We can train a nurse to perform surgeries as a way to help people," explained Cossa. In the research project he conducted during his fellowship, he measured not only the volume but also the quality of surgical care in Mozambique's 45 district hospitals using standard WHO criteria. He tallied the number of operating rooms, operations, accredited surgeons and anesthesia professionals as well as day of surgery death rates and post-operative in-hospital death rates.

Cossa had recognized the need for this kind of data after being appointed chief of surgery for his country's health ministry. "When I got there, someone asked me: How many surgeons do you have? How many procedures are performed each year? What are your stats?" Some information existed, but Cossa suspected the numbers might not be reliable, especially for rural areas. He decided, "If I gather this information, it will help me make decisions based on exactly what we have."

While most surgeons don't conduct research, Cossa's mentors inspired him to break this trend. "I always wanted to do research and I had been searching for an opportunity," said Cossa, who had chosen thoracic surgery as his specialty because Mozambique had no practitioners in that field. Given the country's high rates of tuberculosis, which can require thoracic surgery, he knew he would be able to make an impact. Once he secured his Fogarty fellowship, he cobbled together a team of medical students and residents working in Maputo along with surgeons across the country. "I convinced them that this was important and I sent them a template so they could collect data for me," he said.

The study has already influenced policy decisions. The findings showed the health ministry where operating rooms are needed and which provinces require a surgeon. "We have less surgeons by far than the target set by the WHO



Matchecane Cossa, M.D.

Fogarty Fellow:	2015-2016
US Institution:	University of California, San Diego
Foreign Institution:	Universidade Eduardo Mondlane
Research area:	Evaluation of surgical care in Mozambique

and we have very few ORs, very few anesthesiologists," said Cossa. "But the mortality rate is not that high and is similar to Southern African regions." Surgical death rates of the trained nurses were similar to rates among actual surgeons. "Of course, people would prefer to be operated on by a general surgeon, but the results show that for our country the work of the trained nurses is laudable and very important," he said.

Another result of the study: Cossa has seen a shift in attitudes of younger surgeons, who now express an interest in conducting research. "When you think about LMICs, you think that it's quite difficult to get information but it's always feasible," said Cossa.

An important benefit of his Fogarty project was the online training. "Every week there were programs, classes, all about research," he said. Unexpected lessons were learned as well. "Many people think that, when they gather information from the work they've done, this data belongs to them and they want to keep it to themselves," said Cossa. "Through Fogarty, the most important thing I learned is collaboration and cooperation."

Today, when younger surgeons ask about Fogarty, Cossa tells them "go for it, it will help your career," yet at the same time he cautions that "it takes a lot of time." The greatest benefit of all is the ability to improve yourself, he said: "You can find what is wrong with what you are doing and change it because you have this collaboration with the entire world. Through research you have the opportunity to develop your career as a health professional."

RESOURCES

<https://bit.ly/cossa-surgery>

ADMIRE DUBE, PHD

Dr. Admire Dube is a pharmacist by training and an associate professor of pharmaceuticals at the University of the Western Cape in South Africa. His specialty is nanotechnology research. He completed postdoctoral training with Fogarty support at the University at Buffalo, where he conducted studies on the potential of nanomedicines to treat tuberculosis (TB). This work laid the foundation for his successful application to Fogarty's Emerging Global Leader program. Subsequently, he and two collaborators received a research grant from the NIH's National Institute of Allergy and Infectious Diseases (NIAID) to continue this work.



What did you gain from Fogarty training?

Firstly, the training helped me define the focus of my current research. I initiated research into nanomedicines for the treatment of TB at this time. I gained exposure to various types of nanoparticles, various characterization tools, as well as grant writing skills. My seminal research paper to date was generated during this training period. The training also prepared me to establish my laboratory and secure research funding. This has proved invaluable to my career trajectory, as I have been able to establish a nanomedicine for infectious diseases laboratory here in South Africa, and to secure NIH grants from Fogarty and NIAID.

“My Fogarty award is probably the best thing that has happened in my career because it provided me the protected time to concentrate on my research.”

What is the significance of your research?

In terms of research, I'm working on a project that is using nanoparticles to engineer, or control, an individual's immune system in order to fight off TB infection. In a sense, I'm using nanoparticles to make an immunotherapy. The hope is that the host immune cells can then eradicate the TB causing pathogen without the use of drugs.

We're avoiding the use of conventional antibiotics and instead making these immunotherapies. In my lab, specifically, I'm synthesizing these nanoparticles and characterizing them. We then perform tests in cells and mice infected with TB. This is the next step. We plan to publish research next year that shows that nanoparticles can be effective in killing TB within a cell. The cell becomes hostile to this bacteria and once it's hostile, the bacteria can't survive within that cell.

What else have you learned?

We've already started administering these nanoparticles to mice which are infected with TB. We are putting these nanoparticles into the lungs of the mice directly because TB is a pulmonary disease. We're then going to see whether the immune system of the mice is activated. As a pharmacist, a lot of my expertise is in making nanoparticles. My new training in immunology helped me tag these nanoparticles, bringing the two aspects together so now we can develop immunotherapies.

How has Fogarty impacted your career path?

My Fogarty award is probably the best thing that has happened in my career because it provided me the protected time to concentrate on my research. In so doing, I've now been able to establish my research lab focused on nanoparticles and tuberculosis. I've been able to attract other funding as well, which has led to local and international collaborations with notable scientists where we synthesize and test various nanoparticles. Now that we have our NIAID grant we plan to look at different kinds of nanoparticles.

I think the Emerging Global Leader program is an excellent funding mechanism for early career researchers. It is quite important for researchers to conduct research that is relevant to their local context, something that is afforded by this program. The personal development through mentorship has been great. Additionally, while I'm being mentored, I am mentoring others. I've also been promoted from senior lecturer to associate professor, so I've been able to progress in my career as well as receive funding to conduct this exciting science involving tuberculosis and nanotechnology, something that I'm passionate about doing. There's nothing better than getting to spend time on what you really enjoy!

RESOURCES

<https://bit.ly/admire-dube>

One Health: a holistic approach to improving the health of people, animals and the environment

Researchers may never discover exactly how the current novel coronavirus outbreak began, but they agree that as humans have changed the way they interact with animals and the environment, emerging infectious diseases are rapidly growing in frequency. Accelerating rates of deforestation, human settlements encroaching on forests, global trade and travel, and livestock production are thought to be the underlying drivers of so-called “spillover” events, when diseases jump from animals to humans. For example, bats are one of the species suspected to be the source of the virus that causes COVID-19, while viruses in bats and other animals spurred the Ebola outbreak that began in 2014, MERS in 2012 and SARS in 2002, and others. Constant mutations jeopardize existing vaccines and treatments.

With 70% of emerging infectious diseases originating in animals, there is increasing urgency to prioritize the study of zoonotic diseases. “To anticipate threats for humans, we’ve got to partner with people in other disciplines including animal and environmental health,” said Dr. Gregory Gray, a Fogarty grantee and epidemiologist at Duke University.

The One Health movement aims to integrate the efforts of multiple disciplines to improve health for people, animals and the environment. It has become a

Spillover events, where diseases jump from animals to humans, are increasing in frequency. Humans have acquired MERS coronavirus through close contact with camels.

global effort, including annual conferences that bring scientists and policymakers together to consider how to control existing and emerging infectious diseases. Since the majority of diseases that occur in humans also affect animals, it’s important that the biomedical research workforce includes multidisciplinary practitioners with a broad understanding of subjects such as animal anatomy, physiology, pharmacology, epidemiology, behavior science and infectious diseases. Communication strategies and public outreach are also critical to develop interventions such as educational programs for workers to improve hygiene and increase use of personal protective equipment, development of rapid diagnostics and vaccines, and improved food safety measures.

“To anticipate threats for humans, we’ve got to partner with people in other disciplines including animal and environmental health.”

– DR. GREGORY GRAY, DUKE UNIVERSITY

NIH’s zoonotic research is based at Rocky Mountain Laboratories in Montana. Part of the National Institute of Allergy and Infectious Diseases, it’s a state-of-the-art biomedical facility designed for investigations of highly pathogenic viruses. Fogarty supports studies of emerging global threats through its Ecology and Evolution of Infectious Diseases program, a partnership with the National Science Foundation. The initiative

supports efforts to understand the underlying ecological and biological mechanisms that govern relationships between environmental changes and the emergence and transmission of infectious diseases. Funded researchers explore how environmental events such as habitat alteration, biological invasion, climate change and pollution alter the risks of disease outbreaks in both animals and humans.

As outbreaks of emerging infectious diseases—such as the current COVID-19 pandemic—increase in frequency and impact, scientists and policymakers are calling for an increased emphasis on global preparedness.

Resources: <https://bit.ly/nih-one-health>



Prawn farming reduces disease transmission in Senegal

With one billion of the world's people suffering from malnutrition, there is pressure to intensify agricultural production, especially in the world's poorest countries. However, there is tension between the need to supply more food and the ecological impact that can have. Deploying herbicides, fertilizers, pesticides—as well as improving irrigation—can have unintended consequences for the spread of infectious diseases.

For example, a small dam was built in the Senegal River basin in 1986 to block salt water flowing upstream from the ocean so crop cultivation could be expanded. Shortly after, the local population experienced recurring outbreaks of schistosomiasis, a debilitating disease. Scientists hypothesized that enlarging the area of freshwater in the river basin may have created the ideal habitat for the snails that host the disease-causing parasites, while reducing upriver migration of fish and other snail predators. In addition, agrochemical runoff may have increased algae growth providing a food source for snails, while insecticides might have reduced populations that would normally consume snails, such as prawns, crayfish and water bugs.

A research team led by Dr. Jason Rohr at the University of Notre Dame has been using a Fogarty ecology and evolution of infectious diseases grant to investigate various aspects of the complex problem. Collaborator Dr. Susanne Sokolow has been conducting research in the region since her postdoc, which was funded in 2009 by the NIH's National Institute of Allergy and Infectious Diseases. "Every year the government distributed praziquantel, the recommended anti-parasitic drug for schistosomiasis, to all the kids," said Sokolow. "And yet each year they came back re-infected at almost the same rates as the previous year." Among rural children, prevalence topped 80%. The scientists wanted to understand pre- and post-dam river ecology in order to "creatively interrupt part of the parasite's lifecycle," said Sokolow, who leads Stanford University's disease ecology program.

Working in partnership with a local Senegalese biomedical research institute, one experiment looked at the effects of herbicides on the life stages of schistosomes. Another stocked the Senegal river with native prawns as determined by mathematical models drawn from Sokolow's previous research. This included the observation that prawns consume snails at daily rates of up to 30% of their body weight. The intervention worked: the number of infected snails was reduced by 80% and the local population finally escaped yearly schistosomiasis reinfection. In addition to improved health, the community also gained a dietary protein source and a new cash crop.



Photo courtesy of Upstream Alliance

By introducing prawns into the Senegal River basin, researchers dramatically reduced the population of snails carrying parasites that were responsible for a rise in schistosomiasis after a dam was built.

Care must be taken when considering introducing predators into the environment, Sokolow noted. Previous attempts with American crayfish successfully reduced schistosome-hosting snails in African bodies of water but they also eroded river banks, devoured crops and caused declines in native species.

Her team's most recent experiments, funded by the same Fogarty grant plus other benefactors, focus on agrichemicals and explore how run-off pesticides might kill susceptible prawns. One of Sokolow's experiments uses drones to map river plant life to predict human reinfection rates. "Environmental diagnostics" could someday complement medical treatment and accelerate wellness, Sokolow said.

She believes lessons learned in the Senegal river basin have the potential to reduce global suffering of schistosomiasis, which affects more than 240 million people worldwide and can lead to anemia, impaired growth and development, liver damage and bladder cancer. She led an analysis of schistosomiasis infection data from sub-Saharan Africa before and after construction of 14 large dams and concluded the prawn intervention should be more broadly adopted. "If this could be extended to the agricultural landscapes of Africa and the Americas where schistosomiasis transmission is highest, prawn aquaculture might offer a powerful tool in the global fight against schistosomiasis." She also posed a question for future research: "For what other human disease systems can win-win solutions for people and nature be carried out successfully at scale, while remaining cost-effective?"

Scientists in Tanzania show not every fever is malaria

Fevers are often assumed to be a sign of malaria in Africa—where precise tests for disease diagnosis are not widely available. If left untreated, malaria can sometimes progress rapidly and even cause death. But if over-treated, it can contribute to proliferation of drug-resistant malaria. In Tanzania’s mountainous regions, there are few mosquitoes so other febrile diseases are more likely than malaria.

While studying HIV/AIDS coinfections in the east African country, Fogarty grantee Dr. John Crump came across patients who were admitted to hospitals with severe fever. When they were tested for malaria, only 1-to-2% were positive, said Crump, a Duke University faculty member. “When we looked at the causes of fever, we started to realize how important bacterial zoonoses were as a cause of febrile illness,” Crump said. Not only do these diseases affect human health but they also have financial implications. If animals are sick, they may produce less milk, suffer pregnancy loss and the young may fail to develop normally.

Many Tanzanians raise small quantities of goats and poultry at home. “At one end of the spectrum you’ve got pastoralists, like the Maasai, who live a nomadic lifestyle in very close association with large mixed herds of cattle, sheep and goats. They have the most intense contact with animals and so have the highest disease risk and the greatest dependence on livestock for their livelihoods,” explained Crump. Meanwhile, smallholder farmers seen around the city of Moshi tend not to graze their small herds, keeping them unexposed to other animals.

Crump formed a team of researchers to better understand the underlying issues and answer questions including: What do primary care practitioners believe to be causes of fever? What do they know of bacterial zoonoses? What

Fogarty funded researchers in Tanzania studied causes of diseases that produce fevers, to reduce unnecessary treatment of false diagnoses of malaria.

do district veterinary offices and other livestock sector communities understand about infections?

“It made sense that social science was needed to shed light on those topics,” said Crump. “One Health is a way of working with people from various disciplines in human, animal and environmental health that fits perfectly with the kinds of research questions we face in Tanzania.”

He and his team established a surveillance project to track three zoonotic diseases: leptospirosis, Q fever and brucellosis. The work included estimating disease burden, studying clinical approaches, researching risk factors to determine prevention strategies and testing diagnostics. Practical tasks included literature reviews, patient surveys and statistical analyses. Crump and his team published about 30 journal articles during the project. In one paper, brucellosis was determined to be endemic in northern Tanzania, with 35 cases per 100,000 persons. Another article outlined the etiology, epidemiology, clinical presentation, diagnosis, treatment and prevention of brucellosis, leptospirosis, Q fever and rickettsioses.

All told, Crump believes the project’s greatest impact has been unmasking the concurrent problems of malaria overdiagnosis and bacterial zoonoses underdiagnosis, while pushing patient management toward new approaches for those without malaria. “We’re seeing less empiric treatment for malaria—more withholding of antimalarials if there’s a negative malaria diagnostic test—and consideration of alternative causes of severe fever. Hopefully that’s resulting in better outcomes for patients,” said Crump.

Additional results have also “flowed out of the research,” said Crump, who points to the “Not Every Fever is Malaria” campaign. “The WHO malaria treatment guidelines have also changed—I can’t say we’re entirely responsible for that—but the guidelines now say do a test for malaria first and only use antimalarials if the test is positive.” This major policy shift likely took into account additional research by others as well as increased testing, still all of it “has confirmed that malaria overdiagnosis is not just a problem in Tanzania, but in many places that were once endemic for malaria but are no longer due to successful malaria control activities,” he said.

Crump considers improved infrastructure another significant outcome of his Fogarty work. “The training of Tanzanians and the capacity building for the research platform is possibly the most important thing,” he said. “It’s a long game, but ultimately the goal is for our Tanzanian partners to increasingly garner external support for their research.”



Research improves health among Mongolian herders

Mongolia's economy has undergone rapid changes in the past few decades with marked increases in livestock production of sheep, goats, camels, horses and cattle. As the normally pastoral populations have begun migrating to urban areas, humans and animals are coming into closer contact, increasing the spread of disease. Climate change has exacerbated the situation, requiring nomadic herders to move more frequently in search of water and grazing land for their flocks.

With limited research and diagnostic capacity, Mongolia had difficulty responding to zoonotic diseases. A Fogarty research training grant to Duke University's Dr. Gregory Gray supported a five-year effort to change that. Gray recruited a dozen scientists for training in One Health concepts and innovative diagnostic, epidemiologic and analytical research methods. Mongolian and U.S. scholars spent several months at Duke learning a multidisciplinary approach to research that includes aspects of public health, agriculture, environmental engineering and veterinary medicine. Trainees also learned about responsible research conduct—including human subject protection and the informed consent process—and received anti-sexual harassment instruction.

Then the three-person teams of Mongolian and American scholars designed projects, moved them through ethical reviews, developed budgets and bought supplies. During the process, Mongolian trainees improved their English language proficiency and presentation skills. Gray and Dr. Battsetseg Gonchigoo, of Mongolia's Institute of Veterinary Medicine and others provided mentorship throughout, as the teams conducted their field work, analyzed results, prepared publications and wrote grant applications. The research teams studied various aspects of animal-human interactions over six years and published more than 20 scientific articles with their findings.

Some of the results were surprising, Gray noted. "For instance, we found the first evidence that strains of influenza A virus that commonly infect horses were also likely infecting camels. And we found an unusual rickettsial pathogen in ticks, which might explain some of their tick-bite associated deaths among humans."

Mongolia is home to about 3 million people who co-exist with 50 million livestock, on which they rely for critical resources such as meat and milk products, leather and hides, wool, cashmere, and other goods needed for household sustenance, barter and sale. To better understand the types of animal-human contact, hygiene practices and knowledge of zoonotic diseases, one research team developed and conducted a survey of Mongolian herding households.



Mongolian and U.S. researchers were trained with Fogarty support to study animal-human disease transmission among nomadic livestock herders.

Photo courtesy of Dr. Gregory Gray

Participants reported the contact they had with animals, for instance during birthing, milking or slaughtering. Other risks tallied include handling manure used for fuel. While the majority said they washed their hands after animal contact, most did not after defecation or urination. Less than half the respondents had access to an improved drinking water source and about 50% reported practicing open defecation. Most households had knowledge of disease transmission from animals to humans but far fewer understood the reverse.

Research teams also studied tick-borne infections, demonstrating they are common among domestic animals, small wild mammals and herders. Others focused on mosquito-borne infections that can cause diseases such as encephalitis and West Nile Virus in both animals and humans. Another group used rapid diagnostics to look for influenza A and B, suggesting the tests may be an effective tool for rural practitioners. Other trainees investigated the prevalence and risk factors for intestinal parasites.

Findings from Gray's teams have helped shape Mongolian public health strategies. Researchers developed flyers, videos and an educational handbook for herder safety, encouraging influenza vaccines and the use of personal protective equipment. Text messaging might be considered for future outreach, Gray noted, since the survey found solar-power charged cellphones were present in all herder households.

Gray hopes the discoveries made in Mongolia can help to reduce the burden of zoonotic diseases among pastoral people worldwide. "If we can anticipate when microbiological threats are jumping back and forth between animals and humans before they take hold and become very transmittable, then we can design mitigation strategies," said Gray. "What impacts people in the developing world today can be a problem in our very own back yard tomorrow, so the work that Fogarty does in global health is extremely important in protecting U.S. citizens and their animals."

Fogarty community benefits from virtual engagement



Before the pandemic struck, I spent much time traveling the globe visiting grantee research sites, holding discussions with scientists and health officials and participating in conferences. I hadn't realized how much I thrived on making these personal connections until COVID-19 sidelined me at home. As much

as I have embraced the world of virtual meetings, it has sometimes been a frustrating and exhausting experience. I miss the serendipitous sidebar conversations at events, the ability to renew acquaintances and forge new ones in a free, unstructured way. Sometimes I have found myself struggling to follow simultaneous events, juggling multiple screens, failing to be as fully present as I would have been in person. But in conversations with the Fogarty team, I have come to appreciate that there are exciting opportunities in this brave new world and that many of our grantees and trainees are deriving significant benefits from virtual engagement.

At Fogarty, we have continued our normal practice of convening our community through annual network meetings for those affiliated with each of our funding programs. We've discovered that by eliminating expensive travel for in-person sessions, we have in many cases doubled attendance. This has greatly increased participation by low- and middle-income country (LMIC) scientists and enabled trainees to be able to join the conversation and provide their unique perspectives. We have also heard anecdotally that break-out sessions showcasing trainees have allowed them to share their findings with their peers and cultivate new research partnerships. Some have said they found it inspirational to have the opportunity to measure themselves against the high bar set by their fellow trainees. It also allows Fogarty program officers to hear directly from trainees about how well our initiatives are meeting their needs and what we can do to improve their experiences. The reliance on virtual meetings has also prompted some LMIC institutions to strengthen online learning options and invest in improving internet connectivity, especially in rural areas.

We had planned to host an in-person gathering of Africa's data science community in Uganda last summer to kick off NIH's new DS-I Africa program. We pivoted instead to a virtual networking platform, where we hosted live and taped keynote speakers, panel discussions and other interactive events. We invited individuals and organizations to post profiles, engage in message board discussions and connect informally with potential partners in networking lounges. We were pleased that we far exceeded our expected attendance with 2,234 registrants, about half joining from Africa. The original in-person gathering had been planned to accommodate only 350 attendees. The majority of participants responding to a post-event survey reported they had used the opportunity to engage with scientists outside their discipline and world region. Many said the symposium was more advanced than other virtual meetings they'd attended and thought it pushed the envelope of what it is possible to do to recreate the "in real life" experience.

This fall, NIH held its annual grants workshop online for the first time. More than 20,000 people signed up to participate, which was 20 times the usual number. Fogarty hosted a number of interactive sessions on grantsmanship during the proceedings and staffed a virtual exhibit. We were delighted to see that more than 2,000 participants were from LMICs—a vast improvement from business as usual!

Fogarty's team of disease modelers also got on the virtual bandwagon—offering online genomic epidemiology training to LMIC scientists. Five-day courses included instruction on lab procedures for using the portable MinION sequencing platform, as well as bioinformatic techniques needed to perform quality control of raw data and assemble full SARS-CoV-2 genomes. Trainees learned to create genomic databases and build and interpret phylogenetic trees. The immediate goals were to produce SARS-CoV-2 sequences that can be included in public databases and journal publications. The long-term aim is to advance the use of genomics in public health labs in LMICs.

While I look forward to the day when we can abandon social distancing, we at Fogarty will carefully consider how we can best balance the inclusiveness of virtual engagement with the benefits of in-person gatherings. I think perhaps a mixed-meeting format will become the model for the future.

RESOURCES

<https://bit.ly/global-virtual-mtgs>



Fauci recognized for public service

Dr. Anthony Fauci, director of NIH's National Institute of Allergy and Infectious Diseases, has received a lifetime achievement award from the U.S. Global Leadership Coalition. Fauci was also honored recently by the American Society of Tropical Medicine and Hygiene for outstanding service to the global public as a trusted voice in science.



Pinn honored as pioneer in women's health research

The Women in Medicine Legacy Foundation has recognized the achievements of Dr. Vivian Pinn with its Alma Dea Morani, MD Renaissance Woman Award. Pinn was the first director of the Office of Research on Women's Health at the NIH where she continues to serve, most recently as a Fogarty senior scientist emerita.



Pettigrew receives NSB's Vannevar Bush Award

The National Science Board (NSB) has presented Dr. Roderic Pettigrew with its prestigious Vannevar Bush Award for his public service and scientific contributions. Pettigrew was founding director of the NIH's National Institute of Biomedical Imaging and Bioengineering.



ASTMH awards medal to NIH grantee Happi

Dr. Christian Happi, director of the African Centre for Excellence for the Genomics of Infectious Disease, has been awarded the Bailey K. Ashford Medal by the American Society of Tropical Medicine and Hygiene. Happi is a professor at Redeemer's University in Nigeria.



HHS presents service medal to Ohene-Frempong

Dr. Kwaku Ohene-Frempong has received the HHS's Assistant Secretary of Health Exceptional Service Medal for his outstanding contributions to alleviating global suffering from sickle cell disease (SCD). A professor emeritus of pediatrics at the University of Pennsylvania, he has dedicated his 40-year career to finding a cure for SCD.



WHO Foundation names Soni inaugural CEO

The WHO Foundation has appointed Anil Soni as its inaugural Chief Executive Officer, effective January 1, 2021. The Foundation, an independent grantmaking agency headquartered in Geneva, was launched in May 2020 to work alongside the WHO. Soni joins the Foundation from Viatrix, a global healthcare company, where he was head of infectious diseases.

NIH releases data management policy

To speed development of treatments and vaccines in response to the COVID-19 pandemic, NIH has unveiled a policy requiring researchers to plan prospectively for managing and sharing scientific data generated with NIH funds. It also establishes the baseline expectation that data sharing is a fundamental component of the research process. The new policy will go into effect in January 2023 to give the grantee community time to prepare. Statement: http://bit.ly/NIH_datashare

Research training is available online

Free online lectures and presentations targeting early-career clinician-scientists are available from the NIH's National Institute of Child Health and Human Development. The curriculum includes a variety of topics important for those applying for jobs, writing grants and developing independent research laboratories or programs. Website: http://bit.ly/NICHHD_courses

NAM considers COVID-19, climate change

The National Academy of Medicine has posted video and slide presentations from its recent annual meeting that examined COVID-19, climate change and other urgent threats to human health. The NIH's Dr. Anthony Fauci and philanthropist Bill Gates delivered keynote addresses during the proceedings. Website: http://bit.ly/NAM_meeting

Wellcome announces new funding strategy

UK-based Wellcome Trust has released a new research funding strategy to tackle three of the world's most urgent health challenges. Efforts will focus on improving the understanding and treatment of mental health, exploring the harmful effects of global warming, and working to bring infectious diseases under control and stop epidemics. Strategic plan: http://bit.ly/wellcome_plan

TDR releases gender analysis toolkit

An intersectional gender analysis toolkit has been produced by TDR, the global organization devoted to supporting research and training in tropical diseases. The resource is intended to strengthen research capacity, address barriers to implementation of health interventions and explore solutions to improve access to quality health care. Website: http://bit.ly/TDR_gender

Funding Opportunity Announcement	Deadline	Details
Harnessing Data Science for Health Discovery and Innovation in Africa U2R Research Training Program U54 Research Hubs – AIDS applications	EXTENDED: Dec 18, 2020 Feb 8, 2021	https://bit.ly/nih-dsiafrica-funding
International Bioethics Training R25 Clinical Trial Not Allowed D43 Clinical Trial Optional	Jun 4, 2021	http://bit.ly/BioethicsTraining
Global Infectious Disease (GID) Research Training Program D43 Clinical Trials Optional	Aug 3, 2021	http://bit.ly/IDtraining
Fogarty HIV Research Training for LMIC Institutions D43 Clinical Trial Optional D71 Clinical Trial Not Allowed G11 Clinical Trial Not Allowed	Aug 20, 2021	http://bit.ly/NIHGlobalHIV

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

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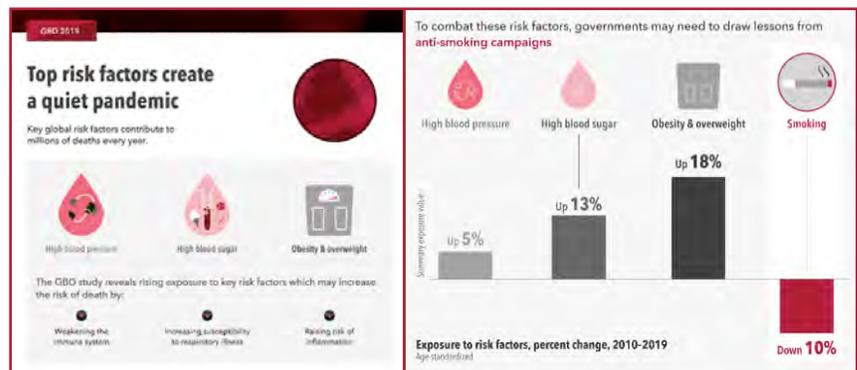
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2019 Global Burden of Disease study highlights rising NCD risk factors



A worldwide crisis of chronic diseases and failure of public health to stem the rise in preventable risk factors have left populations vulnerable to acute health emergencies such as COVID-19, according to the 2019 Global Burden of Disease study.

“Most of these risk factors are preventable and treatable, and tackling them will bring huge social and economic benefits. We are failing to change unhealthy behaviors, particularly those related to diet quality, caloric intake and physical activity, in part due to inadequate policy attention and funding for public health and behavioral research,” said Dr. Christopher Murray, director of the Institute for Health Metrics and Evaluation at the University of Washington, who led the research.

The study reveals that the rise in exposure to key risk factors — including high blood pressure, high blood sugar, high body-mass index, and elevated cholesterol — combined with rising deaths from cardiovascular disease, suggest that the world might be approaching a turning point in life expectancy gains.

RESOURCE

Full report: www.healthdata.org/gbd/2019