



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

NIH working group issues update on equitable research

A new update from an internal NIH working group describes several current initiatives that promote equity across its global health research activities. Among the highlights is Fogarty’s own plan, begun just last year, to provide current grant recipients with additional funding to promote diversity, equity, and inclusion (DEI) in research training programs. Fogarty earmarked more than \$1.7 million to distribute to currently funded grants. Recipients have used the funds to support the training of: health workers from the semi-nomadic Turkana tribe in Kenya; indigenous, Quechua-speaking neuroscientists in Peru; women working as junior faculty in trauma and injury research in the Middle East; and junior and mid-career scientists from underrepresented minorities in India.

The NIH Global Health Research Equity Working Group has representatives from nine NIH Institutes and Centers and a mission to encourage and enable global research collaborations grounded in a shared vision among all partners, with equitable input and decision-making throughout the research process. NIH established the group and issued a request for information (RFI) in 2021.

Some of the feedback to the RFI included: a lack of training in grants management as a barrier to applying for and administering NIH grants and concerns that NIH’s peer review process potentially reflects reputational and



Photo courtesy of Bahare Khodabandou / Weill Cornell Medicine

seniority bias. The Working Group noted a National Institute of Allergy and Infectious Diseases grant program that supports advanced training in NIH grants policy, financial management, and compliance, and highlighted NIH’s new Simplified Peer Review Framework, slotted to go into effect in January 2025, which focuses on the scientific and technical merit of grant applications with the investigator’s expertise and resources rated solely on whether they are sufficient to conduct the research.

The Working Group also acknowledged that equitable global research is an on-going effort. Accordingly, it’s been developing next steps to address the barriers and challenges cited in the RFI.

Barmes Lecture returns June 5

The Fogarty International Center and the National Institute of Dental and Craniofacial Research (NIDCR) present the David E. Barmes Global Health Lecture 2024: “Global HIV/ AIDS Response: Then, Now, Future,” by Ambassador John Nkengasong, U.S. Global AIDS Coordinator and Special Representative for Global Health Diplomacy. The lecture will take place on Wednesday, June 5 at 1 p.m. ET (USA) on the NIH campus and virtually. Information can be found at <https://go.nih.gov/Barmes2024>.



FOCUS



Fogarty’s G-11 program builds support infrastructure

- Building infrastructure so scientists can focus on research
- Fortifying research ethics at Kinshasa University
- Developing research infrastructure in Nigeria

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Fogarty-funded projects receive NIH technology awards

By Mariah Felipe

In the last four years, two Fogarty mobile health (mHealth) grant recipients have received first-place NIH NTAC awards. The NIH Technology Accelerator Challenge (NTAC), launched by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) in 2020, is a series of prize competitions created to stimulate the design of new diagnostic technologies and accelerate the full development of those products for use in low-resource settings.

Detecting blood disorders with a photograph

Dr. Young Kim, professor of biomedical engineering at Purdue University, received a NTAC award in 2020 for his team's Fogarty-funded project that led to the development of a smartphone application with the ability to detect anemia and sickle cell disease by extracting information about the state of microvasculature and blood hemoglobin from a photo of a patient's inner eyelid. The algorithm mimics a spectroscope analysis, which detects how hemoglobin absorbs light.

The algorithm was developed over the course of three years through a collaboration with the Moi Teaching and Referral Hospital via the Academic Model Providing Access to Healthcare (AMPATH) program in Kenya. The NTAC award led to the development of HemaChrome, a startup supported by Purdue, which focuses on bringing the technology back to the U.S. for digital health and telemedicine.

Kim has received additional funding from NIBIB to use machine learning (ML) to assist in spectral recovery, restoring color and light to conventional photos, with a focus on maternal health applications in Kenya. CDC and Kim's team will soon start a trial using ML photo analysis and mHealth applications to detect fluorosis (overexposure to fluoride) and cavities in the teeth of adolescents. Kim notes that a photograph is more than merely a picture; it contains detailed spectral information that can be used by mHealth applications.

"The initial support from Fogarty triggered a chain reaction of research and I'm so grateful for the ample opportunities that ultimately came from that," says Kim who is also a

principal investigator on a Fogarty-funded project using ML-based mHealth technology to prescreen for malaria among school-age children in Rwanda. If the prescreening tool is successful in this setting, it could provide significant cost savings for mass malaria screenings.

Using AI to monitor postpartum recovery

In 2022, a team led by Dr. Bethany Hedt-Gauthier, associate professor of global health and social medicine at Harvard University and associate professor in the department of biostatistics at Harvard T.H. Chan School of Public Health, and Dr. Fredrick Kateera, deputy executive director of Partners In Health and lecturer at the University of Global Health Equity, Rwanda, won the NTAC Maternal Health award for their Fogarty-funded project.

Since 2016, the team has worked to develop a stand-alone mHealth application for community health workers to monitor postpartum recovery of women who had a cesarean delivery. The tool, recently featured in *Science*, allows community health workers to provide new mothers with a home-based diagnosis of surgical-site infections alongside general postpartum monitoring. The app uses computer-vision techniques

and AI to detect signs of infection in the photographs of surgical wounds. The team has focused on rural regions of Rwanda, and their machine learning-based algorithms have achieved nearly 90% accuracy in diagnosing infections.

The NTAC award has allowed researchers to flexibly pursue changes needed to scale the application in Rwanda and beyond. Hedt-Gauthier says, "Systems are constantly updating and getting better, so it's been a learning process for us to understand how we keep up with the pace of that growth."

Both Kateera and Hedt-Gauthier agree that working in Rwanda over the years has opened their eyes to major gaps in postnatal care, in all settings. The NTAC award has been a great motivation for the team, and, as Kateera says, "it has allowed people to grow and work together around optimizing outcomes for new mothers."



Young Kim (in foreground with his back to the camera) takes a photo with a smartphone of the inner eyelid of study participant.

Purdue University / Vincent Wallier

Fogarty's impact on display at CUGH 2024

The 15th annual Consortium of Universities for Global Health (CUGH) conference was held March 7–10, 2024, in Los Angeles, California. The conference theme was “Global Health Without Borders: Acting for Impact.”

Fogarty's first listening session Fogarty hosted its first-ever listening session at CUGH 2024, led by Acting Director Dr. Peter Kilmarx, Acting Deputy Director Dr. Rachel Sturke, and Communications Director Dr. Andrey Kuzmichev. The goal of the session was to gather thoughts and suggestions about global health at NIH going forward. It was also a chance to help Fogarty begin putting together a new strategic plan; the last one was written a decade ago.

Some important topics raised by the group included prioritizing research infrastructure for the health workforce, advocating for research partners in low- and middle-income countries (LMICs), and navigating research in conflict zones.

Creating equitable partnerships in global health In a plenary session centered around how the global health community can work together to balance the playing field between higher- and lower-income countries in all aspects of research, Kilmarx alongside Dr. Patricia García, multiple Fogarty grant recipient and professor at the School of Public Health and Administration at the Universidad Peruana Cayetano Heredia in Peru, Dr. Bethany Hedt-Gauthier, associate professor of global health and social medicine at Harvard University and current Fogarty mHealth grant recipient, Dr. Biraj Karmacharya, director of public health/community programs and global engagement at Dhulikhel Hospital-Kathmandu University in Nepal, and Dr. Elsie Kiguli-Malwade, president of the Fogarty-supported African Association for Health Professions Education and Research (AFREHealth), discussed a broad range of topics including increasing the flow of financial resources to the Global South, restructuring research based on local priorities, elevating the needs of educational institutions in lower-income countries, and advocating for these changes among major global health donors.

Working toward WHO cervical cancer screening goals The National Cancer Institute (NCI) hosted a session on how to integrate the WHO initiative for cervical cancer control into broader global health programs. Dr. Karla Unger-Saldana of Mexico's National Cancer Institute discussed barriers faced by women in Mexico accessing timely diagnosis and treatment for cervical cancer due to cultural norms prioritizing family needs over their own

health. She also shared how indigenous women often feel disrespected within health care settings, hindering effective care delivery. Another presenter, Dr. Hyo Sook Bae of NCI, noted similar barriers in Korea during her presentation and stated, “Patients have the right to be treated properly, nothing should be preventing them from having proper treatment and living a happy life.”

Studies in implementation science Sturke also led a session about a Fogarty-supported collection of implementation science cases focused on global health and conducted in LMICs, spanning a range of regions and disease areas. Dr. Melisa Paolino of the Center for the Study of State and Society (CEDES) in Argentina presented her assessment of the fidelity of HPV self-collection tests in low-income areas of that country. While her trial showed that screening and testing for HPV increased from 20 to 85 percent after the introduction of self-screening via community health workers, multiple changes in government administration have made it difficult to implement this strategy on a national level.

LAUNCH in the spotlight At every CUGH conference, current and former Fogarty Global Health Fellows and Scholars from the Launching Future Leaders in Global Health Research (LAUNCH) Training Program present their work to the global health community. A group of seven program trainees shared their research insights, training experiences, and career trajectories, from treating burn injuries in Nepal to working with cancer survivors in Malawi.

Kilmarx commended the LAUNCH trainees, stating, “We're so impressed by your commitment, creativity, and the diversity of the work that you're doing all over the world.”

From left: Fogarty's Peter Kilmarx, Rachel Sturke, and Andrey Kuzmichev listen to questions from the audience during a listening session at CUGH 2024.



PROFILE

Preventing mother-to-child HIV transmission in South Africa

Dr. Joan Matji conducted her doctoral research through a joint partnership with Yale University and University of Pretoria, South Africa. She focused on the nutritional status of HIV positive mothers and an assessment of infant feeding practices. She observed that, more often than not, the mothers' needs were neglected by the research.

"I often found that we were not asking, 'How is mum doing? How is she coping with her status? How is she doing nutritionally?'" These questions are what motivated Matji's 2005-2006 Fogarty project that investigated associations among postnatal maternal nutritional status, maternal HIV disease progression, and infant feeding practices. Matji's team focused on what was happening to the new mothers after they'd delivered. They explored the influence of each mother's psychosocial well-being on how she fed her child and the health implications of these choices.

At that time in South Africa, the general recommendation for prevention of mother-to-child transmission suggested clinicians assess whether formula feeding was affordable, safe, and sustainable for each mother. Women who did not meet the criteria were advised to breastfeed exclusively, while the government provided free infant formula for mothers living with HIV. "It perpetuated discrimination and stigma around mothers with HIV in the region because everyone knew that, if you had [the government supplied] orange-colored tin or formula, you were HIV positive," said Matji.

To better understand women's childcare choices, she and her team recruited 317 pregnant women with HIV at 28 weeks of pregnancy and a comparative group of about 53 HIV-negative women at the same stage of pregnancy. Most of the pregnant women living with HIV planned to formula-feed, basing their choice on the shame around breastfeeding when HIV-positive. But later, after giving birth, they changed their minds due to the societal stigma around formula feeding. Matji's team found that the women living with HIV who ultimately decided to follow through with formula feeding had only done so because they had either been incentivized by free formula or encouraged to do so by their physicians.



Joan Matji, PhD

Fogarty Scholar:	2005-2006
U.S. institution:	Yale University
Foreign institution:	University of Pretoria, South Africa
Research topic:	Child and maternal health and nutrition
Current affiliation:	UNICEF country representative to Botswana, United Nations Children Fund

The data also showed that about 65% of the mothers were overweight or obese at the end of the study. "This was an interesting finding because, at that time, most people assumed somebody who is HIV positive would be malnourished, even emaciated, but this was not the case among these women." From these findings, Matji and her colleagues began formulating recommendations for holistic interventions to address the stigma around HIV disclosure and infant feeding practices for mothers.

"My training helped me fine-tune the methodologies and approaches that I could use for this research, which was somewhat clinical in nature," said Matji. "It was a great refresher and I also learned new terminologies."

Today, Matji serves as UNICEF's Country Representative to Botswana as part of the United Nations Children Fund. In this role, she manages a staff of 22 focused on developing informed nutritional recommendations and health policies for mothers and children under age 5. The team is developing guidelines to ensure adolescents living with HIV adhere to their treatment regimens and working to prevent violence against children, among many other initiatives. "Because of my Fogarty training, I feel better positioned to critique research findings presented to the organization," said Matji. "I often ask, 'What are the implications for public policy?'"

In the future, she plans to continue advocating for the mothers and children in Botswana and, one day, to get back into research and academia, potentially as a mentor for up-and-coming researchers. Matji advises those entering Fogarty's LAUNCH program: "Keep an open mind and take advantage of the networking opportunities afforded to you. The bonds I formed in this program and the work I did as part of it were so beneficial to my career."

MARTIN LAJOUS, MD, SCD

Martin Lajous, a medical doctor and epidemiologist, became a researcher at Instituto Nacional de Salud Pública (INSP), Mexico's National Institute of Public Health, in 2004. At INSP he helped design and develop the Mexican Teachers' Cohort (MTC) and now serves as its principal investigator. MTC has since become part of the U.S. National Cancer Institute's (NCI) Cancer Cohort Consortium. Lajous has conceived and taught courses at INSP on cancer epidemiology, causal inference (methodologies and strategies that allow researchers to draw causal conclusions based on data), and implementation science.



How did you become aware of aflatoxin exposure in Mexico?

Aflatoxin is a proven Group 1 carcinogen (causing cancer in humans), according to WHO. This toxin comes from two fungi, *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxin often contaminates crops, including maize, a staple food in Mexico, during harvest, processing and storage. Yet aflatoxin was completely under the radar in Mexico.

Now we knew from an NCI group working in Guatemala, the country with the highest burden of liver cancer on the continent, that aflatoxin was an important factor. So, working with this group and a colleague from Johns Hopkins, we took 100 samples from the Mexican National Health and Nutrition Survey—a representative sample of adults living in Chiapas—and sent them to Baltimore to be evaluated. We found that the prevalence of detectable levels of aflatoxin was 86%. By comparison, using the same technique on NHANES data from the U.S., the prevalence is less than 1%. (*The National Health and Nutrition Examination Survey* is designed to assess and track the health and nutritional status of adults and children in the United States. This unique survey, which began in the 1960s, combines interviews and physical examinations.)

So, we found that, basically, aflatoxin exposure is commonplace in Mexico likely due to contamination of maize mainly in the form of tortillas. Fortunately, we found the levels were not as high as reported in Guatemala.

What are your other projects in Mexico?

Developing a colorectal cancer screening program in Mexico became one of my career goals. Over the past five years I have collaborated with researchers experienced in colorectal cancer screening program development through the University of California, San Francisco (UCSF)-Mexico Cancer Initiative sponsored by the Global Cancer Program at the Hellen Diller Family Comprehensive Cancer Center. With them, we designed and evaluated the feasibility of a screening program in an integrated health system in

Monterrey in northern Mexico, an area with high colorectal cancer burden.

This brings us to LISTOS—a 5-year, \$5 million NCI grant given to UCSF, INSP, the Mexican National Cancer Institute (INCan), and UTHealth Houston. LISTOS (Leveraging Implementation Science To Optimize Strategies) for Cancer Control aims to develop a regional center that will be part of a wider network of implementation science centers funded by NCI in low- and middle-income countries. The center includes two cancer control implementation science research projects, one focused on developing a colorectal screening program, the other focused on speeding up the time between diagnosis and treatment for breast cancer patients.

Tell us about the Mexican Teachers Cohort.

The person who first hired me to work at INSP thought that it was a good time for Mexico to develop a large cohort to study cancer—cancer in general and breast cancer specifically. We focused on teachers for various reasons. The majority of teachers in Mexico had participated in economic incentive programs, which required yearly evaluations, so they'd become very accustomed to filling out bubble questionnaires and could self-report lifestyle and health information.

So, with support from the American Institute for Cancer Research the cohort began in 2006–2008 when 115,000 women responded to our baseline questionnaire. We send questionnaires every three to four years to update their health status and lifestyle factors.

MTC is the largest cancer cohort in Latin America, so it has and will provide important information on a region that's completely understudied. Globally, most cancer cohorts are in European and American populations, with some in Asian populations, so it's an important addition to NCI's global cadre of cohorts. Our results will likely be informative for Hispanic populations living in the U.S., where there is limited prospective information on cancer risk factors and occurrence.

Fogarty's G-11 program: Building support infrastructure

By Susan Scutti

Fogarty's "Infrastructure Development Training Programs for Critical HIV Research at Low-and Middle-Income Country (LMIC) Institutions" aims to develop educational programs for improving research support in the areas of technical, administrative, and financial management within organizations located in lower revenue nations. Partnerships uniting U.S. and LMIC institutions are considered most capable of cultivating these critical functions.

Program Director Dr. Geetha P. Bansal explained, "Our G-11 program is a mechanism to build infrastructure at institutions that lack adequate support structures—to help them develop an administration office that can help identify research opportunities, submit applications, manage funding, and complete all compliance and post-award activities. The intention is to establish or reinforce common areas of research administrative support, which any investigator within an institution can access," said Bansal. "The goal is to benefit all researchers, not just one program."

In particular, the program, which has been around for over a decade, addresses gaps in grants management training, which can become barriers to applying for and administering NIH grants. (Notably, responders to a 2021 NIH request for information on promoting equity in global health research also identified the lack of grant expertise in LMICs as a pain point.) And, while G-11 grants can be used to support administration capacity building efforts, they are intended to augment all ancillary activities crucial to conducting high-level scientific investigations.

Critical functions include but are not limited to: research integrity oversight; ethical review of research for the protection of human subjects; laboratory animal welfare oversight; advanced laboratory instrument services; health sciences library and information services; information and communications technology systems (ICT) for research; biostatistics and data analysis; technology transfer and intellectual property protection; and harassment and



Research administrators who have taken part in the training sessions sponsored by UNN and UCSD. From left to right: Joy Udeoma, Pamela Ukeoma, Oge Ojinta, and Amaka Ogidi.

Photo courtesy of Nicole Joyce

discrimination policy and prevention. Few investigators question the necessity to increase institutional support. "We investigators can't do the work we do unless our administrators are well-trained, proactive, and really engaged with us," said Dr. Gregory Aarons of University of California, San Diego (UCSD).

"Research administration is the most important profession you never knew existed," said Nicole Joyce, a UCSD research administrator. She cited a statistic from COGR, a professional society of research universities, affiliated medical centers, and independent research institutes: Changes in policy and regulations increased 172% over the last 10 years. "Researchers who are focused on their scientific proposals, outcomes, and dissemination don't have time to understand all of these regulatory changes. By having solidly trained research administrators, researchers can get more proposals submitted and they'll have better compliance with regulatory changes," said Joyce.

Dr. Eche Ezeanolue of University of Nigeria Nsukka said the G-11 mechanism "allows you to train the people that you don't see—the people who make investigators that apply for grants successful." He compared the systemic improvements that can be accomplished with a G-11 grant to erecting a Christmas tree. "If the Christmas tree is there, then everybody can hang their ornament."

Joyce said, "G-11s are such an important funding instrument because not only are you developing the capacity, the knowledge, the skills, the expertise, but you're developing the 'why.' Why is research important to a country? Why is it important to institutions, communities and individuals?" She believes the more you build awareness and support, the more research will happen.

While she does not have a science background, her profession is critical to research success. "I really believe in science, and I really want to benefit from all the good that researchers do to help society."

Fortifying research ethics at Kinshasa University

“When I started in global health, we used to search for networks or universities with major research grants in Africa, and now it's very commonplace,” said Dr. Adnan Hyder, who's been conducting research in sub-Saharan Africa (SSA) for more than 25 years. Today, almost every country has “something going on, so it's clear the volume of clinical and public health research being done in SSA has really gone up.” World RePORT, an online database of global research investments, supports this perception: the National Institutes of Health funded 1,881 SSA grants in 2016 compared to 3,662 in 2022, while European funder Wellcome Trust supported 110 grants in 2016 compared to 503 in 2022.

This is an advantageous situation, yet difficulties remain. “We found, based on our work in country after country, that, even when clinical trials were being done, one aspect of the research support system—the research ethics system—was very challenging,” said Hyder, a George Washington University (GWU) professor of global health. Dr. Paul Ndebele, a GWU senior research regulatory specialist, identified another stumbling block: “When you look at research ethics committees across Africa, there is a lack of standardization.”

As research proliferates across SSA—and the Democratic Republic of the Congo (DRC) in particular—research ethics systems need continuous reinforcement. “This has been a pain point for Kinshasa University (KU) for years,” said Hyder.

Systems approach

Hyder and Ndebele collaborated with Dr. Paul Lusamba, a professor at Kinshasa University's School of Public Health (KUSPH), on the proposal, “Strengthening Ethical Review Capacity in DRC.” Their G-11 project, which covered the period from May 2020 through December 2023, aimed to fortify the ethical knowledge and skills of the KUSPH institutional review board (IRB) and improve its efficiency and performance.

They began with a needs assessment. They evaluated the knowledge and skills of research ethics committee members and staff. Next, the team looked at review processes to find pain points. After this, they showed the KUSPH-IRB good examples of efficient systems and then asked, *Which systems (or parts of a system) are useful for your context?* Hyder explained, “We never impose ideas from outside. It is incredibly important for local professionals, faculty, and staff to determine what is, and isn't, useful for them.”



The School of Public Health building at Kinshasa University

While Hyder drove strategy, Ndebele addressed the details, overseeing coursework provided by GWU's summer institute, various ethics seminars, and several trainee webinars. Additionally, he arranged workshops conducted by GWU educators in Kinshasa and managed technical support. Pulling out all the stops, the team leveraged previous and ongoing ethics capacity building efforts supported by Fogarty to strengthen their influence. Dr. Imran Bari, a GWU senior research associate, who works with the team on a bioethics program in Mali, helped build relationships in the DRC—an intentional dovetailing of two francophone countries, Hyder explained. “We have to use all of our experience. We are currently in Mali, Zambia, and Pakistan.”

Useful tools

On the brink of submitting their final project report, Ndebele noted that KUSPH-IRB's standard operating procedures have been improved using checklists. Meanwhile, standard disclosure forms and other tools have helped resolve conflicts of interest. Ndebele also provided templates so the IRB can develop management plans and strategies to mitigate any impacts caused by conflicts of interest. Bari noted, “When the project started, KU was hiring new IRB committee members and research committee members. We asked them to aim for greater gender diversity; now almost a third are female.”

Hyder said, “It was clear to us that if we could help local colleagues solve some of this inefficiency, we would help improve the entire research system. In a qualitative, anecdotal manner, we believe that's what happened.” Since Kinshasa University is a leader in the DRC, this progress will benefit the entire country. Hyder concluded, “The sustainability, energy, enthusiasm of local partners—the local institution—has got to be ultimately responsible for this. The drivers must come from them.”

Developing research infrastructure in Nigeria

A handful of forthright words spurred Dr. Echezona Ezeanolue to reconsider his career. In 2010, he was a Robert Wood Johnson Health Policy Fellow in the office of Kathleen Sebelius, then U.S. Secretary of Health and Human Services. “They were talking about how, despite all the money spent in Nigeria by the U.S., it was one of four countries where HIV testing among pregnant women was less than 20%. So, the secretary turned to me and said, ‘You’re from Nigeria—why can’t you help?’”

At that time Ezeanolue’s appointment was at the University of Nevada, Las Vegas, and all his research was U.S.-based. Yet he left Sibelius’ office determined to work in Nigeria. Soon after, he applied for and received a grant jointly funded by the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), Fogarty and the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) studying mother-to-child HIV transmission.

Community orientation

To work with women on their own terms, Ezeanolue started a community-based intervention in 40 neighborhoods and villages. He decided to offer additional services since he knew HIV/AIDS was highly stigmatized. This way, he’d attract more participants. “We called the pregnant women and asked them what else could we offer them. The first thing they mentioned was nutrition during pregnancy, what could they eat if they couldn’t afford multivitamins?”

“The second thing [the mothers asked about] was sickle cell checkups,” said Ezeanolue, noting Nigeria has the highest number of people in the world born with sickle cell disease. “Then we asked the men what they wanted, since they drive the women to (and pay for) health care.” The men wanted anemia check-ups. “So, we added hemoglobin testing. And, in Nigeria, the number one cause of disability is stroke from undiagnosed and uncontrolled hypertension, so we added blood pressure to our list. Finally, we included depression screening.”

Ezeanolue’s first project in Nigeria yielded 25 publications. “We had data on HIV, anemia, sickle cell, hypertension, and depression.” Since that project, he’s acquired an additional role at University of Nigeria Nsukka (UNN) and conducted several NIH-funded studies in Nigeria, including Strengthening Research Administration Infrastructure for HIV Research, a Fogarty G-11 project that is still underway.



Greg Aarons (left) and Eche Ezeanolue (right) celebrate their partnership in front of the NISA banner.

Laying the groundwork for research infrastructure

One of the world’s largest HIV epidemics exists in Nigeria; 1.8 million people there live with HIV. The U.S. government has made substantial investments in HIV care and research in Nigeria, and UNN College of Medicine has implemented multiple projects, but only as a sub-awardee. While 93% of researchers at UNN expressed interest in submitting grant applications, only 28% knew where to get research administration support, a needs assessment found. Ezeanolue’s project, a partnership between UNN and University of California, San Diego (UCSD), aims to further develop, professionalize, and reinforce research administration and management infrastructure at UNN so that it can become a primary grant recipient.

Dr. Gregory Aarons, a professor at UCSD, is a principal investigator (PI) on this G-11 project. “I was doing training on implementation science for Fogarty in sub-Saharan Africa, and I got to meet many researchers, including Eche Ezeanolue,” recalled Aarons. “I became very interested in Eche’s community-based research approach for implementing HIV prevention and treatment for pregnant women.”

Ezeanolue developed his singular research approach following a network meeting organized by Fogarty’s Dr. Rachel Sturke and NICHD’s Dr. George Siberry. In his experience, Nigerian scientists had to go outside the country to learn what’s happening inside the country. Returning to Nigeria, he immediately called all the PEPFAR-funded investigators there to discuss forming a platform—an alliance for implementation research.

NISA, an engine for growth

The Nigerian Implementation Science Alliance (NISA) has three main focuses, he explained. First, NISA develops infrastructure to conduct clinical trials and implementation

science. Second, it builds a cadre of well-educated research staff. Third, NISA brings together investigators, policymakers, NGO staff, and others to share ideas and learn what researchers have already done, so they can avoid repeating what hadn't worked, while adopting and scaling up what had.

Today, NISA rests on four pillars: weekly research-in-progress meetings; monthly webinars; quarterly research sharing weeks; and a yearly conference. Aarons, a NISA conference keynote speaker over multiple years, said, "I was really impressed with the ability of Eche and the UNN team to bring people from across Nigeria and other West African countries to NISA, where people could learn about implementation science." Aarons also saw how the first-of-its-kind practice-based research network developed from NISA could build on the G-11-funded program in developing research capacity.

Ezeanolue explained, "We selected two sites from each of the country's six regions and made them what we call 'implementation laboratories.' If we implement something in two sites in every region and it works, then each of those sites will become model innovation centers to help scale-up regionally."

Ezeanolue is director of UNN's Center for Translation and Implementation Science (CTAIR), the network's organizing hub. His and Aaron's G-11 grant, then, aims to strengthen the research administration infrastructure of UNN and CTAIR.

The grant requires training 12 people in research administration. Aarons said, "We cast a wide net to look for who was really poised to be in those administration roles. We didn't want to train people if they weren't going to actually go back and practice." Then they brought in an additional 12 people, doubling the number of trainees. "Remember the 12 network sites, two in each region?" Ezeanolue asked. "We're also training one community research engagement officer from each of those sites. These are the people who go to the church, the mosque, the community, and talk about the research we're about to do, why it's important and why people should participate."

Integrating administration and research training

Nicole Joyce, a UCSD research administrator, had never met Aarons before receiving an email from him in 2020, requesting information about her program. "In our first meeting, it slowly dawned on me that he didn't want to just send staff to my training—he was asking me to co-develop a capacity building program with UNN." She immediately felt intimidated. "Administrators don't cross over to the research side very often." However,



Stephan Orafa (left), UNN-CTAIR, works with Neil Dutcher, UCSD, to learn how to develop a detailed budget for a proposal submission

Photo courtesy of Nicole Joyce

Joyce's infectious enthusiasm for research administration was clear to Aarons, who believed this could be a great opportunity for her to make a difference in global health.

Joyce's training strategy is anchored to the research administration life cycle: "So we look at pre-award activities, post-award activities, compliance activities, and the systems, tools and resources you might need to perform those activities." Though Joyce began her UNN training in the usual way, she quickly learned to adapt to the realities of Nigeria's infrastructure. "They commonly have power outages and unreliable Internet. Some trainees didn't have laptops, software, or tech skills." When they trained on-site in Enugu, Nigeria, the team encountered unexpected hurdles when SAM (the U.S. government system for awards management) couldn't "talk to" another system. "A little technical challenge around an address character limitation ended up costing us nine months and not being able to pay a sub-awardee."

"Today, NISA rests on four pillars: weekly research-in-progress meetings; monthly webinars; quarterly research sharing weeks; and a yearly conference."

Nevertheless, the team scored undeniable triumphs. Notably, a National Cancer Institute research grant awarded to Aarons and Ezeanolue alongside the G-11 project helped provide the trainees with much needed real-world experience. Aarons said, "We're developing a sense of collaboration. Hands-on coaching and mentoring continue during the project's second year via weekly, sometimes daily calls." He added, "Through everyone's enthusiasm, it's going way beyond what we proposed—it's building not just UNN's infrastructure but a nation's infrastructure."

DIRECTOR'S COLUMN

GUEST OPINION — By David J. Spiro, PhD, Director, Division of International Epidemiology and Population Studies
Fogarty International Center



Charting the evolutionary course of influenza



A recent study in eLife, authored by Drs. Amanda Perofsky and Cecile Viboud from the Fogarty International Center, aims to better understand how antigenic drift—the

accumulation of genetic changes—in influenza viruses affects the size and severity of seasonal epidemics each year.

Influenza is a cunning opponent. The flu, short for influenza, is a contagious respiratory illness that affects the nose, throat, and lungs. The viruses that cause the flu continuously accumulate genetic changes to escape detection by your immune system. This process, known as “antigenic drift,” is the reason why you can get sick with the flu each winter, even though you’ve been previously infected or vaccinated.

In theory, flu viruses with increased antigenic drift make people more susceptible to infection, leading to more cases and earlier, larger, or more severe epidemics. However, evidence for this in epidemiological data is unclear. What has been well understood is that two influenza virus types, influenza A and influenza B, routinely co-circulate in humans and cause annual outbreaks in the U.S. One subtype of influenza A, named A(H3N2), experiences the fastest rates of antigenic drift, and causes more cases and deaths than other seasonal flu viruses.

What Perofsky, Viboud and their co-authors discovered is significant: Patterns of genetic changes in broad sets of epitope sites (small regions on the surface of antigens that are recognized by immune system components, such as antibodies or T cells) had stronger, more consistent relationships with different measures of flu epidemic dynamics than the “gold standard” serological assays used to measure how flu viruses change from season to season. These assays, laboratory tests that check for the presence of antibodies or other substances in blood samples, are used to develop yearly flu vaccines.

The authors also looked at how epitope changes in the flu virus’ two major surface proteins—hemagglutinin (HA) and neuraminidase (NA)—could be used to predict things like epidemic intensity and virus transmissibility. They found that genetic changes of H3, the HA antigen of the A(H3N2) virus, were more strongly linked to larger epidemic sizes, higher viral transmissibility, more cases in adults than children, and a greater number of excess deaths caused by the A(H3N2) virus each season than changes in N2, the NA antigen of the A(H3N2) virus. Meanwhile, antigenic drift of N2 was more strongly associated with increased epidemic intensity (“spikier” epidemic curves) and fewer days from epidemic onset to peak incidence, a measure for the speed of an epidemic, than changes in H3.

“This study provides support for the inclusion of NA in flu vaccines and highlights the importance of monitoring evolution in both HA and NA to inform vaccine strain selection and epidemic forecasting efforts.”

Importantly, the researchers also discovered that the level of co-circulation of A(H1N1) viruses was more predictive of the size of A(H3N2) epidemics than viral evolution. So, although antigenic drift in both HA and NA contribute to differences in A(H3N2) epidemics across seasons, subtype interference (the co-circulation of different influenza viruses) is more important than viral evolution when it comes to shaping annual outbreaks.

Overall, the study’s authors found that increased susceptibility to flu occurs during seasons with high antigenic drift. This study is also the first to link antigenic drift in NA to the disease burden, timing, and the age distribution of cases. Because HA elicits a stronger immune response than NA, the researchers had expected HA to demonstrate stronger relationships with seasonal incidence, so this outcome surprised the authors. Currently, NA content is not standardized in vaccines, even though anti-NA antibodies lessen the severity of flu infections.



Joshua A. Gordon concludes chapter as NIMH Director

Dr. Joshua A. Gordon will end his tenure as the director of the National Institute of Mental Health (NIMH) on June 14, 2024. He plans to return to Columbia University, as chair of the department of psychiatry, while also serving as director of the New York State Psychiatric Institute.



Former Harvard School of Public Health dean passes

Dr. Howard H. Hiatt, former dean of the public health school (now the Harvard T.H. Chan School of Public Health) died at his home in Cambridge, Massachusetts, in March. In the early 1960s, he collaborated with future Nobel laureates on the identification of messenger RNA.



Krupp granted Fulbright Global Scholar Award

Dr. Karl Krupp, University of Arizona, will use a Fulbright Global Scholar Award to compare how two cities—Mysore, India, and Stockholm, Sweden—support elderly populations. In Mysore, people in their 60s and 70s consume five times more government-sponsored health care than younger residents; in Stockholm people over 90 have high rates of chronic problems like dementia.



Arlotta wins National Academy of Sciences award

Dr. Paola Arlotta of Harvard University was named the 2024 Pradel Research Award recipient for her work providing insights into the principles that guide development of the cerebral cortex, the portion of the brain responsible for cognition. Arlotta is principal investigator on a Fogarty grant studying molecular principles of neuronal maturation and integration in the adult and aging brain.



Abdellatif wins travel award from IADR

Enas Belal Abdellatif, Alexandria University, Egypt, has won the 2024 International Association for Dental, Oral, and Craniofacial Research (IADR) Newell Johnson Travel Award. Abdellatif aims to help prevent oral diseases, empower those from disadvantaged communities, and minimize oral health inequalities, especially in low- and middle- income countries.

Neurological conditions leading cause of ill health

A March 2024 study published in *The Lancet Neurology* found a range of neurological conditions collectively represent the leading cause of ill health worldwide. The Global Burden of Disease 2021 Nervous Systems Disorders Collaborators estimated these conditions affected 3.4 billion people and caused 11.1 million deaths in 2021.

TB burden in youth a mixed picture

Among people between the ages of 10 and 24, the toll of tuberculosis (TB) decreased between the years 1990 through 2019, a study published in *Pediatrics* found. Yet, drug-resistant TB infections increased within that age group during that time span, with South Africa showing the highest increase.

IVI to open Africa office

The International Vaccine Institute (IVI), a non-profit organization with a mission to discover, develop, and deliver safe, effective, and affordable vaccines, will open its Africa Regional Office in Kigali, Rwanda, this year. The new office is expected to play a pivotal role in providing on-the-ground support and leadership for IVI's work in Africa.

Antiviral shows promise in treating Ebola

Ebola Sudan infections currently have no approved vaccines or treatments. A small study of primates published in *Science* examined the antiviral drug obeldesivir, a relatively inexpensive pill that can be stored at room temperature. Studies suggest obeldesivir could prove beneficial in fighting all species of Ebola as well as Marburg virus disease.

Intervention speeds up ART adoption

Social work follow-up reduced the time it took for patients hospitalized with HIV in Tanzania to start antiretroviral therapy following discharge. As described in *JAMA*, Fogarty-funded researchers found that 92% of people in the intervention group attended an HIV clinic by the end of the first month versus 75% in the control group.

Funding Opportunity Announcement	Deadline	Details
International Bioethics Training D43 Clinical Trial Optional R25 Clinical Trial Not Allowed	Jun 6, 2024	go.nih.gov/BioethicsTraining
Chronic, NCDs & Disorders Research Training D43 Clinical Trial Optional	Jul 15, 2024	go.nih.gov/NCDtraining
Fogarty HIV Research Training G11 Clinical Trials Not Allowed D71 Clinical Trial Not Allowed	Aug 22, 2024	go.nih.gov/HIV-ResearchTraining

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

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Aging institute to fund research on US life expectancy gap

The National Institute on Aging (NIA) has issued a notice of special interest (NOSI) on research that examines worsening life expectancies in the U.S. compared to other countries. NIA aims to support projects that examine cross-national and U.S. cross-regional or cross-state differences that may drive poor health outcomes. Projects focusing on other high-income countries as well low- and middle-income countries (LMICs) are welcomed. In fact, research from LMICs is encouraged as these countries often have greater variation and speed of change in policies compared to high-income countries.



After peaking in 2015, life expectancy in the U.S. declined one full year to 78 years of age in 2021. People in many other countries, including those with lower per capita income, live longer than U.S. residents.

A 2021 report led by the National Academies of Science, Engineering and Medicine (NASEM) identified three top causes of death that are higher in the U.S. compared to other countries: substance use, increasing rates of suicide, and poor cardiovascular health. The notice from NIA encourages research that investigates the factors leading to death, disease, and disability uncovered by this report.

More information can be found at: <https://go.nih.gov/NOT-AG-24-004>