



2017-2018 IMPACT REPORT

Duke

GLOBAL HEALTH
INSTITUTE

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COVER:
Nepali health community volunteers learn how to use mobile phones and SMS messaging to register patients with mental illnesses.

BACK COVER:
A woman in Madre de Dios, Peru, gets an anemia test on a hand stained from applying the juice of Huito, a medicinal native fruit, to her child.

THIS PAGE:
Somaliland's first and only female surgeon and her surgical assistant operate on a pediatric patient at Edna Adan University Hospital.

FROM THE DIRECTOR

Not long after I arrived at the Duke Global Health Institute, I met Dorothy Dow, an assistant professor who is based in Tanzania. A pediatric infectious disease specialist by training, Dorothy first worked in Tanzania as a student in DGHI's Master of Science in Global Health program, intending to help combat the spread of AIDS and other infectious diseases. But when she began meeting teens living with HIV, she realized many had an even more urgent problem. They were struggling with depression and other mental health issues.

This insight led Dorothy to refocus her work. Today, she leads a research project that is helping our partners improve the mental well-being of HIV-positive teens. When I asked her why she changed the scope of her research, her answer was simple: it was where help was needed most.

As I have met people throughout the DGHI community, I have heard similar stories again and again. Our faculty routinely stretch their research interests to address emerging health issues. Our students transcend disciplinary boundaries to expand their knowledge and skills. Our partners point us toward new opportunities for collaboration and bring insights into where our work can make a difference. And in every case, the motivation is an abiding desire to have the greatest possible impact on the health of the communities with whom we work.

As an academic institute, DGHI's primary purpose is to create and disseminate knowledge, and we do that very well. But underlying this mission is a set of humanitarian values that guides our every effort. This is a community that measures its success more by the lives we affect than by the number of publications we produce.

In this report, you will see dozens of examples of how our commitment to impact is changing lives around the world. You'll see how our educational programs are shaping the next generation of global health leaders. You'll see innovative research that is producing creative new approaches to pressing health challenges. You'll see trenchant policy analyses that guide top-level decision-making. And you'll see partnerships fueling projects that have global reach, yet are firmly grounded in local communities.

I am grateful for the many groups and individuals who make such work possible. We benefit from an outstanding advisory board and strong partnerships with both public and private funding agencies. We also receive generous support from individual and organizational philanthropy, which endows projects across the globe.

Your support is a source of inspiration and motivation for us. Because of you, we can continue to be there, wherever help is needed most.

CHRIS PLOWE

Director, Duke Global Health Institute

Chris Plowe (right) and DGHI professor Wendy Prudhomme-O'Meara (middle) greet a man whose home serves as a mosquito collection site for a study in Webuye, Kenya.



“This is a community that measures its success more by the lives we affect than by the number of publications we produce.”

— AROUND THE INSTITUTE —

Plowe Begins as DGHI Director

In January 2018, Chris Plowe began his tenure as director of DGHI and professor of medicine and global health. Plowe previously served as the Frank M. Calia MD Professor of Medicine and the founding director of the Institute for Global Health at the University of Maryland School of Medicine. He succeeds DGHI's founding director Michael Merson, who stepped down in June 2017 after leading the institute since 2006.

Described by Duke Provost Sally Kornbluth as a “star in the global health field,” Plowe led a clinical translational malaria research program at the University of Maryland that was funded by the National Institutes of Health and the Bill & Melinda Gates Foundation.



Martha Masaki, a study coordinator at Majengo Clinic in Moshi, Tanzania, shows Chris Plowe a questionnaire from a study aimed at increasing uptake of HIV testing among high-risk populations.

DGHI Launches Two New Centers

DGHI has established two new centers: the Duke Global Health Innovation Center and the Center for Global Reproductive Health.

The Global Health Innovation Center—led by Krishna Udayakumar, associate professor of global health and medicine and executive director of Innovations in Healthcare—is a joint initiative with the Duke-Margolis Center for Health Policy and the Duke Institute for Health Innovation. It will support health innovation through links to health policy reforms and integration with health

innovations at Duke. It will also serve as an academic base for faculty, staff, trainees and students working on health innovation and policy globally.

Led by Megan Huchko, associate professor of obstetrics and gynecology and global health, the Center for Global Reproductive Health aims to foster expertise on policies, programs and innovations in reproductive health through rigorous research, education and strong relationships with collaborators in partner countries.



DGHI IS ... INTERDISCIPLINARY

Experts Team Up to Address Refugee Health Needs

When Emily Esmaili began working as a pediatrician at Lincoln Community Health Center, a Durham clinic that serves many resettled refugee families, she soon realized her patients' most pressing needs often weren't things medicine could help.

"The issues have more to do with cultural acclimation," says Esmaili, who spent three years treating patients in Laos and Rwanda before coming to Durham. Most families who come to her clinic don't speak English and are struggling to adapt. Even visiting a pharmacy can be an insurmountable barrier. "The support they need goes well beyond what medical professionals are trained to provide."

Seeking ideas to help her patients, Esmaili began knocking on doors at Duke, where she was pursuing a master's degree in bioethics and science policy—and where she now holds a fellowship through DGHI's Hubert-Yeargan Center for Global Health. She soon connected with Kathryn Whetten, a global health professor and director of the Center for Health Policy and Inequalities Research (CHPIR), who agreed the problem needed a team approach.

Whetten brought in two DGHI colleagues—physician Nathan Thielman and Deborah Reisinger, a French professor who has worked with resettlement agencies to provide language services to refugees. Together, they designed a yearlong project through Duke's Bass Connections program to assess the barriers families like those in Esmaili's clinic face. Launched in fall 2017, the project enrolled nine Duke students, representing fields from public policy to chemistry.

"It was a very diverse group, and that allowed us to address issues from a variety of perspectives," says Melissa McGovern, a research coordinator with CHPIR who facilitated the project. One of the biggest advantages was that the team was multilingual, allowing students to conduct focus groups with refugee families in Swahili and French.

"It was a very diverse group, and that allowed us to address issues from a variety of perspectives."

The students identified significant needs, including access to mental health care for refugee children and parents facing the stress of resettlement. They also noted how simple logistics such as making a medical appointment or even riding a bus can become obstacles for families unfamiliar with American systems.

To help families navigate such challenges, students produced brochures, which are being translated into several languages and distributed at agencies and clinics around Durham. This fall, students will produce accompanying videos as part of Reisinger's course on global displacement.

"My wish is that these children have the same health and access to health care as every child in Durham," Esmaili says. "I'm just fortunate to be in a place like DGHI, which has so many different resources to help make that happen."

Three DGHI Members Win CUGH Awards

Michael Merson, founding director of DGHI, received the Consortium of Universities for Global Health Distinguished Leadership Award in recognition of his exceptional contributions throughout his 45-year global health career. Merson is the Wolfgang Joklik Professor of Global Health and vice president and vice provost for global affairs at Duke University.

Nimmi Ramanujam, the Robert W. Carr, Jr., Professor of Biomedical Engineering and a DGHI faculty member, received the Drs. Anvar and Pari Velji Emerging Leader in Global Health Innovation Faculty Award in recognition of her leadership in developing a compact, low-cost device that enables healthcare providers to screen for and diagnose cervical cancer (see related story, page 11).

Mercy Asiedu, a PhD student in Ramanujam's lab and a global health doctoral scholar, received the Drs. Anvar

and Pari Velji Emerging Leader in Global Health Innovation Student/Trainee Award. Asiedu conducts research on using light to detect cancer in low-resource areas.



Gifts Endow Two Global Health Professorships

\$8.2 million has been invested in DGHI programs through the Bill & Melinda Gates Foundation Global Health Matching Grant.

Two new endowed professorships have been funded as part of the Bill & Melinda Gates Foundation Global Health Matching Grant.

Kathleen Sikkema, professor of psychology and neuroscience, global health, and psychiatry and behavioral sciences, has been selected as the first Gosnell Family Professor of Global Health.

In January 2017, DGHI deputy director Randall Kramer was named the Juli Plant Grainger Professor of Global Environmental Health.

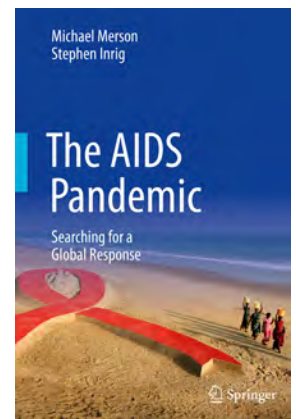
Hotez Gives Inaugural Dzau Lecture

In February 2018, DGHI hosted the inaugural Victor J. Dzau Distinguished Lecture in Global Health, a series designed to bring global health thought leaders to Duke and engage faculty, staff and students across Duke in dialogue about global health issues. Peter Hotez, dean of the National School of Tropical Medicine at the Baylor College of Medicine and an internationally recognized expert on neglected tropical diseases, delivered the first lecture, which is supported by a gift from Dzau, Duke's former chancellor of health affairs and one of the key figures in DGHI's formation.



Michael Merson Co-Authors Book on AIDS Response

In their new book, *The AIDS Pandemic: Searching for a Global Response*, founding director of DGHI Michael Merson and Stephen Inrig, director of the graduate program in health policy and management at Mount Saint Mary's University, identify key deficiencies in the response to the AIDS pandemic and provide a clear analysis of the lessons that can, and should, be learned for improving the response to AIDS and future global pandemics.



NEW FACULTY



TAMARA FITZGERALD
*Assistant Professor of Surgery and
 Global Health*
 School: Medicine



AMY HERRING
*Professor of Statistical Science and
 Global Health*
 School: Arts & Sciences



MYAING NYUNT
*Associate Professor of Medicine/Infectious
 Diseases and Global Health*
 School: Medicine



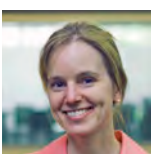
CHRIS PLOWE
*Professor of Medicine/Infectious Diseases
 and Global Health*
 School: Medicine



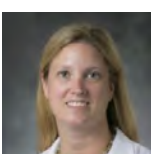
NEIL PROSE
*Professor of Dermatology and
 Global Health*
 School: Medicine



MICHAEL RELF
*Professor of Nursing and
 Global Health*
 School: Nursing



MEGAN RELLER
*Associate Professor of Medicine/Infectious
 Diseases and Global Health*
 School: Medicine



KRISTIN SCHROEDER
*Assistant Professor of Pediatrics and
 Global Health*
 School: Medicine



DORI STEINBERG
*Assistant Research Professor of Nursing
 and Global Health*
 School: Nursing



BRIAN STONER
*Research Professor of Electrical and Computer
 Engineering and Global Health*
 School: Pratt

DGHI SCOPE



PRIMARY FACULTY



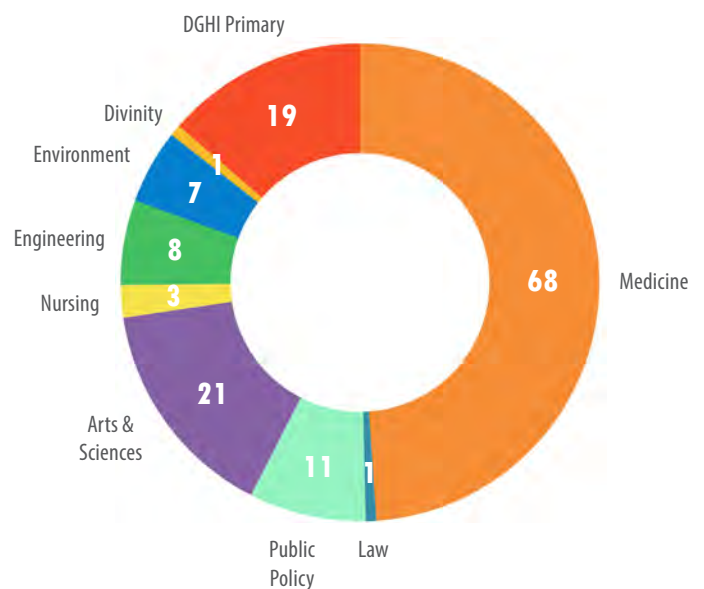
AFFILIATE FACULTY



STAFF

STRENGTH IN INTERDISCIPLINARITY

DGHI includes faculty from eight Duke Schools



EDUCATION

178

Undergraduate
majors

171

Undergraduate
minors

78

Master of Science
students

20

Doctoral Certificate
students

7

Doctoral
scholars

Enrollment as of fall 2017

DGHI Partners with Peace Corps to Offer Fellowships

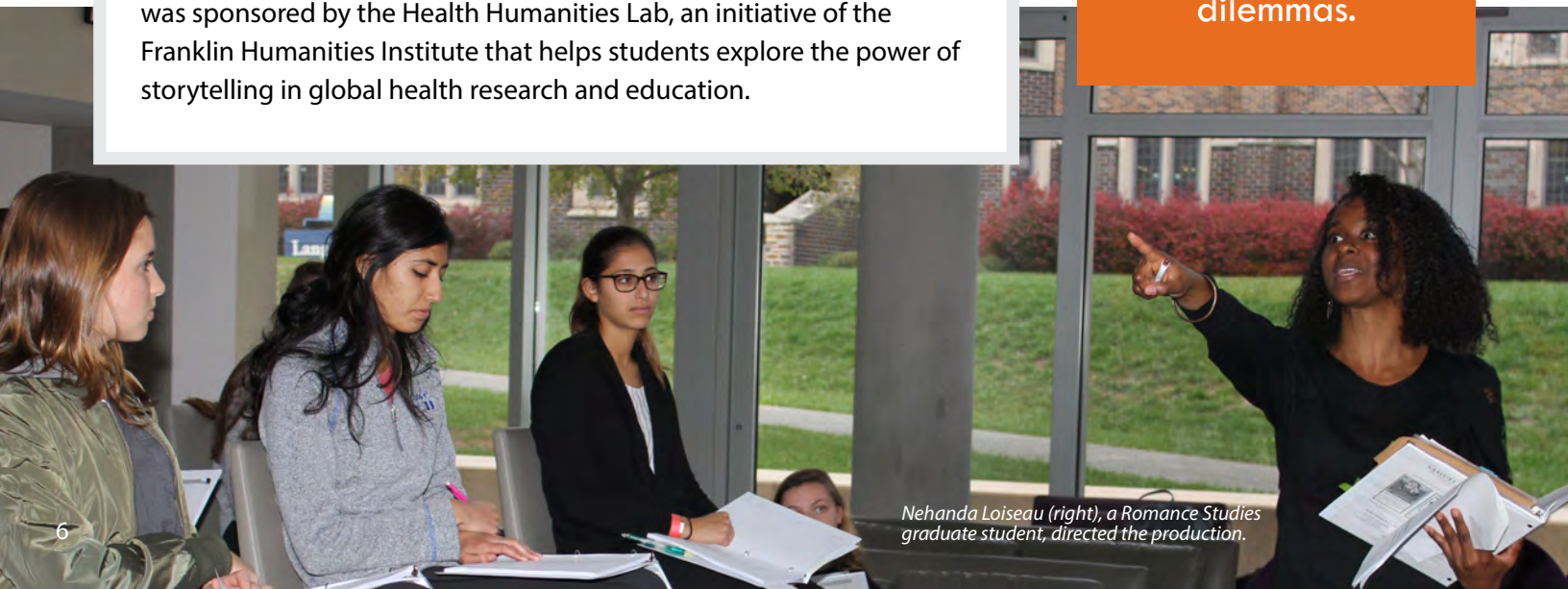
This year, DGHI welcomed its first two fellows—Julie Zemke and Beth Eanelli—from the Peace Corps’ Paul D. Coverdell Fellowship Program. Through this program, up to five returned Peace Corps volunteers enrolled in DGHI’s Master of Science in Global Health program receive a 50 percent tuition scholarship and

an assistantship focusing on research or projects that benefit underserved U.S. populations. The field experience returned Peace Corps volunteers bring to the program sets them apart from many other candidates, says Sarah Martin, assistant director for graduate admissions and special projects.


Course Teaches Global Health Ethics Through Drama

Global health professor Kearsley Stewart tapped into the humanities to help teach students about the ethics of health intervention. In fall 2017, she had her undergraduate students read and perform “Informed Consent,” a play based on a true case of research misconduct. Her goal was to challenge students with a dynamic, interactive experience that would help them more deeply understand the emotional and motivational factors that play into ethical dilemmas. The performance was sponsored by the Health Humanities Lab, an initiative of the Franklin Humanities Institute that helps students explore the power of storytelling in global health research and education.

The goal was to challenge students to more deeply understand the emotional and motivational factors that play into ethical dilemmas.



Nehanda Loiseau (right), a Romance Studies graduate student, directed the production.

A photograph of two young adults, a woman and a man, standing in a busy open-air market. They are both wearing backpacks with blue tubes protruding from them. The woman is on the left, smiling, and the man is on the right, also smiling. They are surrounded by other people and market stalls in the background.

Kerry Mallinson
and Rick Tsao in an
open-air market in
Malaysia.

DGHI IS ... EXPERIENTIAL

Learning About Viruses Where Viruses Are Born

The first couple of times Kerry Mallinson and Rick Tsao strolled through the open-air markets in Sibul, Malaysia, they drew some concerned glances. A few vendors pointed at their backpacks and wondered about the strange, protruding tubes.

Their curiosity was understandable. It's not every day you see a virus hunter at work.

For 10 weeks during the summer of 2017, that's what Mallinson and Tsao were. The two students, both undergraduates majoring in global health, were part of a field research project in Malaysia to study the emergence and spread of infectious diseases. One of their tasks was to collect air samples in places where humans and animals mix—hence the backpacks. The tubes connected to bioaerosol devices that took in particles from the air, which the students later screened for human and animal viruses.

This kind of surveillance is important in places like Southeast Asia, where dense populations create a ripe environment for the spread of infectious diseases. In Malaysia, Duke students have been analyzing samples from farms and markets in hopes of better understanding how and when animal pathogens begin to infect humans. Their efforts are helping health workers more quickly spot worrisome viruses, says Gregory Gray, a professor of medicine and global health who guides the fieldwork.

"In conducting their field research over this summer and last, our students have set up more

than 30 new microbial assays at Sibul and Kapit Hospitals," says Gray. "Now the hospital doctors are able to diagnose diseases that they could only guess at before."

"When you see firsthand the effect these diseases have on people's lives, it just shapes you in a way we can't do in the classroom."

But even considering such lasting impacts, the greatest benefactors of fieldwork may be the students themselves. "Being able to see what you've learned in the classroom applied in the field is invaluable," says Jane Fieldhouse MS'17, one of the six Duke students who worked in Malaysia in 2017. "I learned leadership skills and skills that are not necessarily teachable in the classroom."

For Gray, the field offers a setting to turn students' knowledge into passion and inspiration. "When you go overseas and see firsthand the effect these diseases have on people's lives, it just shapes you in ways we can't do in the classroom," he says. "That kind of experience is so influential in setting these students on a course for their future careers."

Fellowships Support International Master's Students

Two years ago, Rita Masese was a medical doctor working at a children's hospital in her native Kenya. Assumpta Nantume, from Uganda, was serving as a clinical pharmacist in her home country. What the women shared was a desire to expand their understanding of global health issues facing low- and middle-income countries.

A new DGHI fellowship is allowing them to do that. The von der Heyden Family Global Health Fellowship fund, part of the Bill & Melinda Gates Foundation Global Health Matching Grant, is

designed to help international students pursue graduate education at DGHI. Masese, the first recipient, graduated in May 2018 after completing a project on HIV-infected adolescents in Tanzania transitioning to adult care. Nantume, who received the fellowship this past year, is studying malaria prevention among sickle cell patients in Kenya.



Rita Masese



Assumpta Nantume

DGHI Professor Authors Research Methods Textbook

When Eric Green started teaching the "Research Methods in Global Health" course at Duke a few years ago, he couldn't find any research methods textbooks that integrated global health examples. So Green, assistant professor of global health, decided to write the textbook that would become the foundation of his course.

Published online in the fall of 2017, *Global Health Research: Designs and Methods* is designed to help students become better consumers of research and prepare them to contribute to global health research teams. Students learn how to ask research questions, critically evaluate scientific literature, select an appropriate research design, develop a sampling and measurement plan and make an impact with their work.



115

students and scholars performed field work in 25 global locations during the summer of 2017.



Fieldwork in Webuye, Kenya.

HANDS-ON LEARNING



Undergraduate Karina Martinez Romo interviews a participant in a Bass Connections study aimed at reducing human mercury exposure in the Peruvian Amazon.

Bass Connections Opens Doors for Global Health Students

Global health continues to have a strong presence in the Bass Connections program, one of Duke's signature efforts to promote interdisciplinary learning and research. In 2017-2018, 17 global health-themed project teams investigated a range of topics from the impacts of an oil spill in Peru to the social networks of HIV-positive youth in South Africa. DGHI offers nine global health-themed Bass Connections courses, which incorporate mentoring across student levels, problem-centered learning, interdisciplinary perspectives and community engagement.

- 45** year-long global health-themed projects since 2012
- 52** DGHI faculty and affiliates have participated on Bass Connections teams
- 275** students have participated in global health-themed projects

Doctoral Scholars Program Branches Out

In the past year, the Global Health Doctoral Scholars program welcomed faculty mentors and scholars from several new disciplines, helping to expand the breadth of doctoral global health training at Duke. The new mentors are Elizabeth Turner from biostatistics and bioinformatics, Amy Herring from statistical sciences and Megan Huchko from obstetrics and gynecology. All three faculty members also hold DGHI appointments. The program this year included scholars from ecology, law, statistical science and biomedical engineering.

The Doctoral Scholars program enables PhD candidates from across Duke to work with faculty and conduct research related to global health. DGHI currently has 13 doctoral scholars.

RESEARCH

Leveling the Odds for Pediatric Cancer Patients

Kristin Schroeder and Nelson Chao have identified some of the most formidable barriers keeping children in Tanzania from receiving effective cancer care. They've also devised a clever way to overcome some of them.

Schroeder, assistant professor of pediatrics and global health, and Chao, professor of medicine, immunology, pathology and global health, have been studying the experience of pediatric cancer patients in Tanzania, where only 20 percent of children survive cancer.

Beyond the expense of treatment, they note travel and other logistics as prime reasons why families abandon treatment.

To improve those odds, the professors founded a nonprofit organization, iCCARE, to provide services to families seeking cancer treatment at Bugando Medical Centre in Mwanza. In partnership with the hospital, they hired a patient navigator to educate families about treatment and identify cancer symptoms in children admitted for other reasons. And the unique partnership is paying off: the survival rate at Bugando has increased from 19 to 39 percent, and the treatment abandonment rate has decreased from 47 to 32 percent.



iCCARE built a hostel near the Bugando Medical Centre, where some families stay while their child receives treatment.

Efforts by faculty members in DGHI's Global Cancer initiative have helped increase the survival rate at the Bugando Medical Centre from 19 to 39 percent.

Motorcyclists Provide Insights into Road Traffic Injuries

For anyone who has lived or worked in a low-resource country, it's no surprise that motorcycle riders are involved in a large share of traffic accidents. By some estimates, about half of all traffic deaths involve motorcyclists, cyclists and pedestrians. What's more surprising is that these riders, many of whom make their living as informal taxi drivers, may also be part of the solution to decreasing traffic incidents.

As part of a larger effort to combat traumatic brain injuries in low-resource countries, DGHI researchers

Catherine Staton, Joao Vissoci and Truls Ostbye surveyed motorcyclists in Rwanda, Sri Lanka and Tanzania to identify traffic "hotspots" where accidents most frequently occur. The studies not only showed that data from motorcyclists aligned well with police data—which is often incomplete—but also identified additional hotspots. The research team found that this crowdsourcing approach is less costly than collecting police data and is easily reproducible, adaptable and interpretable.



Ramanujam showcases an earlier version of the callascope at the "Invented at Duke" event in October 2017.

DGHI IS ... INNOVATIVE

A Simple Device to Address a Complex Problem

A few years ago, Nimmi Ramanujam was talking with a Tanzanian doctor about the challenges his clinic faced in screening women for cervical cancer. As often happens when an engineer confronts a global health hurdle, the conversation quickly turned to gear.

But amid the chatter about camera resolution and inadequate microscopy, the doctor mentioned something else—that his patients just disliked being examined.

“And immediately, that stuck in my mind, that it wasn’t about building a more powerful camera or having superior resolution,” recalls Ramanujam, professor of biomedical engineering and global health. “It was simply that women don’t like speculums.”

Many cases of cervical cancer go undetected because the standard procedure for colposcopy, which involves using a speculum to spread the walls of the vagina in order to take images of the cervix, is painful and intrusive. The exam also must be performed by a trained specialist, making access to screening problematic in many low-resource countries.

Ramanujam and her research team have spent the past five years developing a pocket colposcope, a handheld device about the size and shape of a tampon that greatly eases the discomfort of an exam. The device has been tested in the United States, Kenya, Peru, Zambia, Tanzania, Honduras and India, and feedback has been extremely positive. “Providers are telling us it’s much easier to use and that it saves them time,” Ramanujam says.

The team has now released a second version, called a callascope, that eliminates the need for a speculum entirely. Ramanujam says it’s so easy to use that they have given devices to women to try on their own at home. One volunteer said that if it were the standard for testing, she would not be so hesitant to come in for an exam.

In that respect, the callascope represents a larger aim of global health innovators such as Ramanujam, who are seeking to use technology to level disparities that have often been exacerbated by limited access to sophisticated tools. Ramanujam’s team is focused on lower-cost innovations that can easily be applied in low-resource settings.

“The only way we will reduce the burden of cervical cancer in developing countries is by creating simple devices at an affordable price.”

“The only way we will reduce the burden of cervical cancer in developing countries is by creating simple devices at an affordable price,” says Jose Jeronimo, senior adviser for women’s cancers with the global innovation organization PATH and DGHI adjunct professor. “This is a brilliant device that fits perfectly with the work we need to do in those areas.”

Establishing a Safety Culture Is Key to Saving Lives

Henry Rice and some of his Duke Health colleagues are applying their patient safety expertise to encourage hospitals in low-resource settings to promote communication, collaboration, quality and safety.

The development of safety cultures in healthcare facilities across the world has the potential to affect billions of lives, and even small, low-cost, easy-to-implement changes can lead to major improvements in patient outcomes and staff satisfaction, says Rice,

professor of surgery and global health.

In a recent study, Rice and his colleagues measured the safety culture at a pediatric nephrology unit in a Guatemalan hospital and used the data to develop targeted, low-cost safety initiatives. Rice says the unit began seeing improvement in the culture within a few months. The researchers also anticipate a longer-term effect on clinical and organizational performance, which they're in the process of assessing.

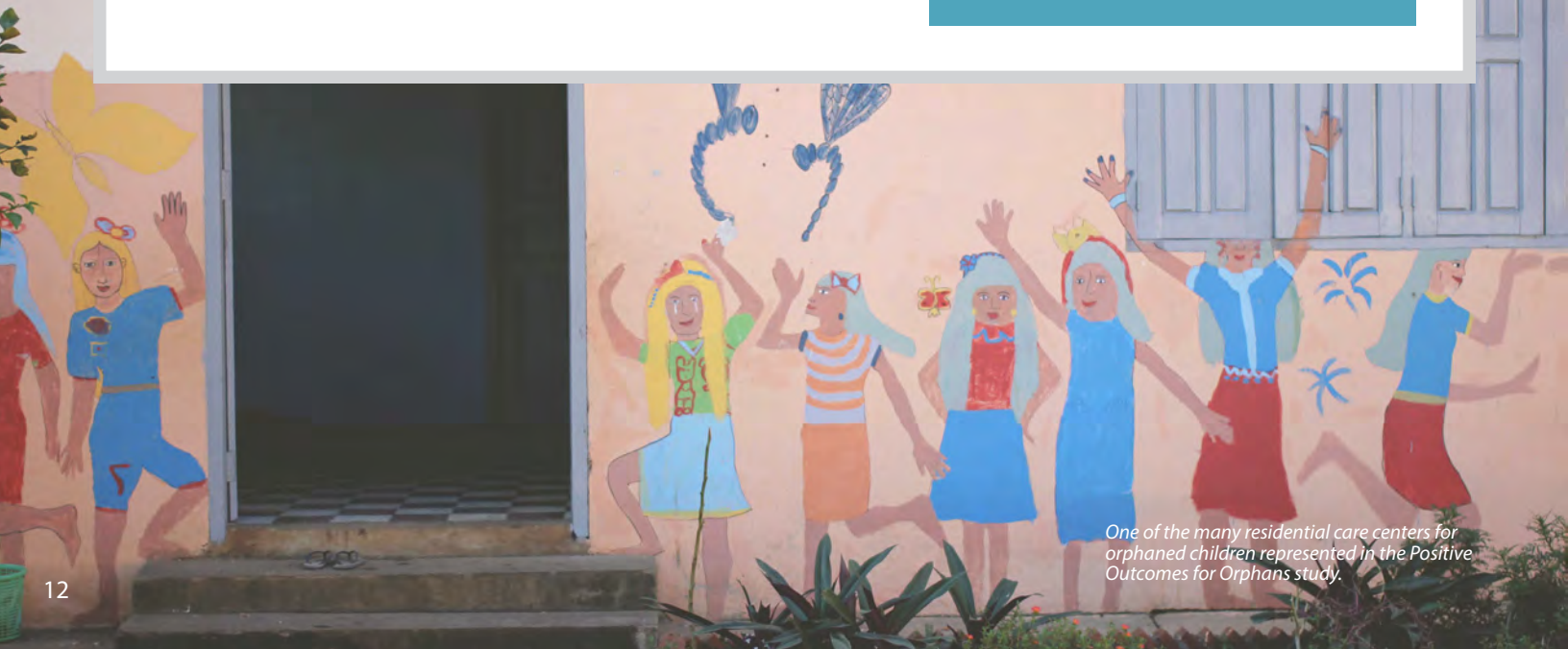
Decade-Long Study of Orphaned Children Gets New Boost

One of DGHI's longest-running research projects—the only multi-country study to follow a large cohort of orphaned and separated children—is continuing to yield insights on the development of a vulnerable population.

Led by Kathryn Whetten, director of the Center for Health Policy and Inequalities Research, the project—known as “Positive Outcomes for Orphans”—is analyzing the emotional well-being, cognitive development and relationships of more than 3,000 orphaned and separated children living in Cambodia, India, Ethiopia, Kenya and Tanzania. The study has been influential in showing that, despite a widespread bias against institutional care for orphans, the quality of caregiving matters far more to overall health and well-being than the setting.

In 2017, the National Institutes of Health funded a third round of the study, which allows researchers to investigate the factors that contribute to and protect against HIV infection among this cohort of children. The team hopes to determine why this group is at such high risk for contracting the disease.

The quality of caregiving matters far more to the overall health and well-being of orphaned and separated children than the setting.



One of the many residential care centers for orphaned children represented in the Positive Outcomes for Orphans study.

New Tools Can Help Social Enterprises Succeed

Thousands of social entrepreneurs are hard at work around the world trying to solve the most pressing challenges in global health, but they often lack a clear approach to assess their impact. To fill this gap and help make social enterprises more effective, DGHI's Evidence Lab, in collaboration with the Social Entrepreneurship Accelerator at Duke (SEAD) program, has developed a set of five easy-to-use evaluation tools.

The free toolkit contains resources and templates to help innovators better understand and communicate their organization's impact, says Joy Noel Baumgartner, director of the Evidence Lab. "These capacity-building tools are the distilled lessons and guidance that the Evidence Lab communicates one-on-one with many innovators." The toolkit was funded primarily by USAID's Higher Education Solutions Network through the SEAD program.



Keeping Women's Health on the Agenda

In October 2017, DGHI hosted "Advancing Women's Health in a Changing Political Environment," a symposium geared toward generating conversation and action to advance women's health research and ensure access to women's health care. North Carolina Congressman David Price and Jen Kates, vice president and director of global health and HIV policy at the Kaiser Family Foundation, gave keynote talks.



U.S. Rep. David Price addresses researchers on women's health care.

Impact on Policy: DGHI Studies Point the Way

One of the ways DGHI seeks to improve global health is by informing and analyzing health policy at local, national and international levels. The past year saw a number of influential studies that are having a direct impact on global health policy. Here are just a few examples:

- An analysis led by Shenglan Tang, DGHI professor and executive director for global health programs at Duke Kunshan University, revealed that **China will face challenges in meeting the health-related Sustainable Development Goal targets** established in 2015, despite having made impressive progress toward achieving the Millennium Development Goals launched in 2000. According to the study, which was funded by the Bill & Melinda Gates Foundation, the health challenges that China will likely have the most difficulty addressing are child obesity and non-communicable diseases such as diabetes, mental health and tuberculosis.
- Gita Suneja, associate professor of radiation oncology and global health, co-chaired a panel that crafted **clinical guidelines for treatment of HIV-infected cancer patients**. The National Comprehensive Cancer Network's new "Guidelines for Cancer in People Living with HIV" will support oncology providers in delivering safe, effective treatment for HIV-positive people who are diagnosed with cancer. Suneja advocated for the development of the guidelines after her research uncovered these gaps in care.
- A study led by DGHI's Center for Policy Impact in Global Health found that **many technologies critically needed to fight some of the world's most prevalent infectious diseases** are unlikely to be developed in the current research and development pipeline. Using a new financial modeling tool to estimate the costs of product development, the researchers found that only 128 of the 538 candidate products analyzed were likely to progress to a successful product launch. The study identified 18 high-priority "missing" products, where the pipeline is not likely to yield advances of particular need.
- Wendy Prudhomme-O'Meara, associate professor of medicine and global health, was one of more than 180 researchers and policymakers who proposed **new recommendations to advance the effort to rid the world of malaria**. The group, organized by the Malaria Eradication Scientific Alliance (MESA), called for improved innovation and integration among strategies to eliminate the disease. Prudhomme-O'Meara co-authored an article focused on characterizing the reservoir and measuring transmission of malaria.



DGHI professor Wendy O'Meara and field researcher Eric Nalimya look for mosquito larvae from sample sites in Webuye, Kenya.

Improving AIDS Care After Trauma

The lingering effect of trauma is a significant reason women with HIV fail to keep up with anti-retroviral therapy. Kathleen Sikkema, the Gosnell Family Professor of Global Health and professor of psychology and neuroscience, has been working to address this issue. With colleagues at Duke and the University of Cape Town, she has developed a new coping intervention for HIV-positive women with a history of sexual abuse.

Called ImpACT, the program offers four individual and three group sessions. In pilot tests, participants had decreased post-traumatic stress symptoms and increased coping and motivation to adhere to HIV treatment. The researchers say more intensive interventions may be needed to improve and maintain those results, and they are pursuing funding for full-scale clinical trials.

Air Pollution Cancels Health Benefits of Exercise



Exposure to air pollution on city streets is enough to counter the beneficial health effects of exercise in adults over 60, according to a new study co-led by Junfeng “Jim” Zhang, professor of global and environmental health.

The findings show that short-term exposure to traffic exhaust on a busy street can cancel out the positive effects a two-hour stroll would otherwise have on older adults’ heart and lungs. This is the first study to document these negative effects on healthy people as well as those with pre-existing cardiorespiratory conditions such as chronic obstructive pulmonary disease or coronary heart disease.

Global Health Research at Duke: THE BIG PICTURE

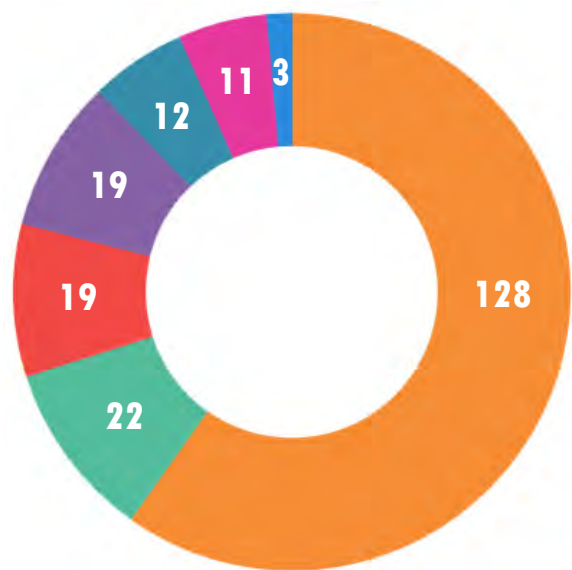
IN 2017-18, DUKE FACULTY HAD

214

active research projects
related to global health,
with total extramural funding
of more than

\$61 million

GLOBAL HEALTH GRANTS BY SCHOOL



- Medicine
- Environment
- DGHI primary appointments
- Arts & Sciences
- Public Policy
- Engineering
- Divinity

PARTNERSHIP

Symposium Brings International Partners to Duke

Ten East African researchers traveled to Duke in spring 2018 to collaborate with DGHI faculty, fellows and students on issues of reproductive and maternal health. Organized by DGHI's new Center for Global Reproductive Health, the three-day symposium gave international scholars an opportunity to share their work, receive leadership and mentorship training, refine grant-writing skills and network.



Symposium participants strategize about communication tactics in a leadership workshop.

Global Health Summer Course Launched in Sri Lanka

DGHI's longstanding partnerships in Sri Lanka have led to the creation of a new study abroad course. The pilot course, designed in collaboration with faculty from the University of Amsterdam's Academic Medical Centre, was held in summer 2018 in Galle, Sri Lanka, and brought together students from Duke and the University of Amsterdam. The program, based at the University of Ruhuna, combined classroom instruction with field trips to learn from local public health experts, practitioners, community members and leaders. Instructors were Truls Ostbye, professor of community and family medicine and global health, and DGHI adjunct professors Vijitha de Silva, of the University of Ruhuna; and Guus ten Asbroek of the University of Amsterdam.



Course participants visit a rubber plantation to learn about occupational health challenges workers face.



DGHI IS ... COLLABORATIVE

Bringing the Tools to Improve Epilepsy Treatment

Christopher Komakech lays a vinyl measuring tape across a bald, plastic mannequin head and with a red marker draws an X a few inches above the base of the skull. "It's all about precision," he explains, studying the tape carefully. "If you miss by one inch, you may miss the area where the electrical activity is taking place."

Komakech, a psychiatric nurse at Butabika National Hospital in Kampala, Uganda, is demonstrating the international standard for placing electrodes for an electroencephalogram (EEG), the most critical exam for diagnosing neurological conditions such as epilepsy. While it's estimated that 700,000 Ugandans have epilepsy, very few have had an EEG, and only a handful of clinicians in the country perform the exam.

"Our goal is to increase the capacity to treat epilepsy in Uganda, both medically and surgically."

A cross-continental collaboration led by the Duke Global Neurosurgery and Neuroscience division is working to change that. In 2018, the program brought Komakech and three Ugandan colleagues to Duke to

learn advanced EEG techniques and train with Duke epilepsy specialists. They returned with six new EEG machines, donated by the medical equipment company Cadwell, which will be used in two hospitals in Uganda.

It's part of an effort to help Uganda deal with a growing number of epilepsy cases, says Michael Haglund, a professor of global health and neurosurgery. While epilepsy typically can be managed through medications or surgery, many cases in Uganda go undetected or untreated. The country has few neurologists who treat the disease, and many Ugandans associate epileptic seizures with psychiatric problems or witchcraft and seek traditional healing. In addition to the training and equipment, the project has also initiated Uganda's first comprehensive study of the burden of epilepsy, led by DGHI graduate alumni Nadine Sanchez and Payal Chakraborty.

"We're linking all of the key people working on epilepsy at Duke and in Uganda," Haglund says. "Our goal is to increase the capacity to treat the disease, both medically and surgically."

The partnership builds on more than a decade of Haglund's work in Uganda, which established neurosurgery units at Mulago, Mbarara and Mengo hospitals and launched the country's first neurosurgery residency program. During that time, the number of neurosurgeons in Uganda has grown from five to 12, and the goal is to reach 50 by 2030.

Mark Kaddumukasa, a neurologist at Mulago Hospital and part of the team that trained at Duke, predicts similar results from the new focus on epilepsy. "I anticipate that this will be a long-term collaboration that will benefit research and mentoring on both sides," he says. "We will grow together."

DGHI Professor Returns “Home” to South Africa

Lauren Franz, who grew up in South Africa, jumped at the opportunity to return to her home country through DGHI’s Faculty in Residence program. Participating in the program helped Franz advance her research and strengthen DGHI’s priority partnership with the University of Cape Town.

During her year-long residence, which began last July, Franz continued work on a five-year project to adapt an evidence-based early intervention for autism to a low-resource setting. She also helped facilitate training for

two University of Cape Town clinicians in parent-child interaction therapy for young children with disruptive behaviors.

Franz, assistant professor of psychiatry and global health, says one of the highlights of the program was the opportunity to work with one of DGHI’s primary partners in South Africa—Petrus de Vries, the academic head of child and adolescent psychiatry at the University of Cape Town and the founder of the Center for Autism Research in Africa.

DGHI Philanthropy Funds International Policy Fellows

Last fall, DGHI’s Center for Policy Impact in Global Health hosted its first two global health policy fellows, Addis Kassahun Mulat from Ethiopia and Daniel Victor from India.

The three- to five-month fellowship, funded through a small family foundation as part of DGHI’s Bill & Melinda Gates Foundation Global Health Matching Grant, is offered to early- or mid-career professionals from low- or middle-income countries. Fellows engage in policy analysis, quantitative and qualitative global health policy research, communicate the findings of the center’s research with policy makers and write policy briefs and

research papers.

During his fellowship, Mulat conducted a retrospective and prospective policy analysis of a pilot program in Ethiopia to implement community-based health insurance and social health insurance schemes. Victor studied the implementation challenges and resource allocation associated with India’s National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke.



Addis Kassahun Mulat (L); Daniel Victor (R)

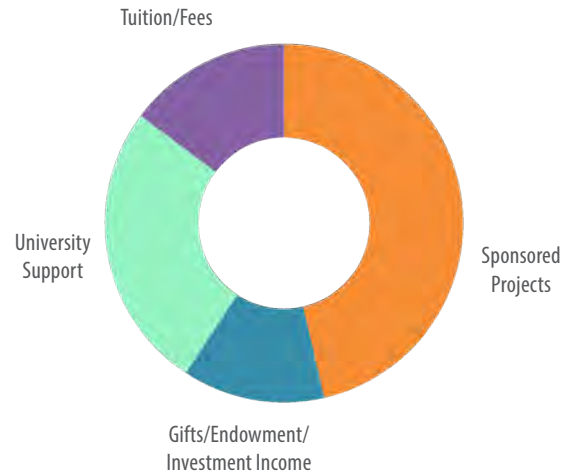
PRIORITY PARTNERSHIP LOCATIONS



Beijing, China
Kunshan, China
Shanghai, China
Leogane, Haiti
Delhi, India
Eldoret, Kenya
Lima, Peru
Singapore
Cape Town, South Africa
Galle, Sri Lanka
Moshi, Tanzania
Kampala, Uganda

FUNDING SOURCES

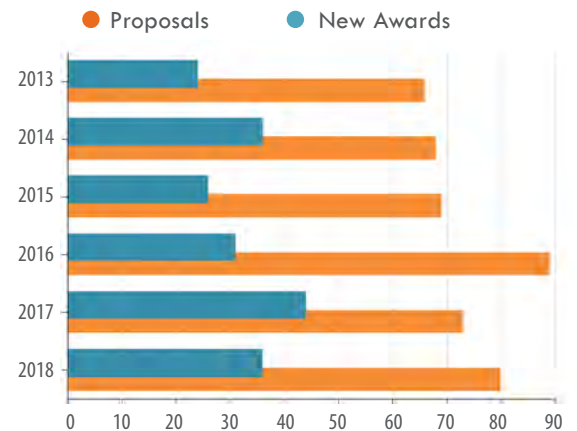
CATEGORY	FY18 (\$)	FY17 (\$)	FY16 (\$)
Sponsored Projects	12,794,565	13,311,043	13,311,043
University Support	7,172,185	5,556,361	5,212,000
Gifts/Endowment/ Investment income	3,548,114	4,166,113	2,383,629
Tuition/fees	4,059,294	3,629,353	3,075,242
Total	\$27,574,158	\$26,662,870	\$24,956,332



EXTERNAL RESEARCH FUNDING

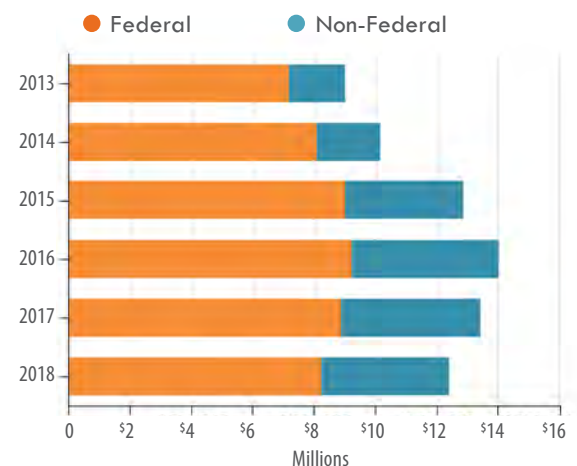
Proposals and New Awards

	PROPOSALS			NEW AWARDS		
	Federal	Non-Federal	Total	Federal	Non-Federal	Total
FY13	41	25	66	15	9	24
FY14	32	36	68	19	17	36
FY15	43	26	69	14	12	26
FY16	47	42	89	17	14	31
FY17	38	35	73	22	22	44
FY18	36	44	80	19	17	36



Research Expenditures

	FEDERAL (\$)	NON-FEDERAL (\$)	TOTAL (\$)
FY13	7,186,163	1,828,358	9,014,521
FY14	8,088,197	2,087,963	10,176,160
FY15	9,017,933	3,870,433	12,888,366
FY16	9,229,324	4,792,124	14,021,448
FY17	8,885,495	4,544,640	13,430,135
FY18	8,234,158	4,185,716	12,419,875



Notable New Grants

PRINCIPAL INVESTIGATOR	SHORT TITLE	SPONSOR NAME	SCHOOL/UNIT	PROJECT TOTAL \$
Plowe, Chris Nyunt, Myaing	International Center of Excellence for Malaria Research in Myanmar	NIH	DGHI/Medicine	8,511,941
Nyunt, Myaing	Malaria elimination in Myanmar	Bill & Melinda Gates Foundation	DGHI/Medicine	7,911,545
Udayakumar, Krishna	Accelerating Saving Lives at Birth: A Grand Challenge for Development	USAID	DGHI/GHIC/ Sanford	6,600,000
Whetten, Kathryn	Positive Outcomes for Orphans: HIV Risk as Young Adults	NIH	Sanford/CHPIR	3,497,950
Whetten, Kathryn	Task-sharing mental health care in low-resource settings	NIH	Sanford/CHPIR	3,359,044
Udayakumar, Krishna Baumgartner, Joy Noel	Evaluating Saving Lives at Birth: A Grand Challenge for Development	USAID	DGHI/GHIC	2,767,668
Reif, Susan	Community Resources for Empowerment and Wellness	Substance Abuse and Mental Health Services Administration	DGHI/CHPIR	2,499,608
Zhang, Junfeng	Potential pathophysiologic mechanisms linking air pollution exposure in pregnant women to reduced birth weight	University of Rochester	Nicholas	1,453,150
Gray, Gregory	Detecting Novel Emerging Viruses at the Human-Animal Interface in Pakistan	U.S. Department of State	DGHI/Medicine	982,675
Reif, Susan	COMPASS	Southern AIDS Coalition	DGHI/CHPIR	929,902
Story, Mary	Healthy Eating Research Technical Assistance & Direction	Robert Wood Johnson Foundation	DGHI/Medicine	900,596

Selected Publications

TITLE	JOURNAL	DUKE AUTHORS
Association of Ozone Exposure with Cardiorespiratory Pathophysiologic Mechanisms in Healthy Adults	<i>JAMA Internal Medicine</i>	Drew B. Day ² , Junfeng (Jim) Zhang ¹
Development of Enhanced Ethanol Ablation as an Alternative to Surgery in Treatment of Superficial Solid Tumors	<i>Scientific Reports</i>	Robert Morhard ² , Jenna L. Mueller ³ , Nirmala Ramanujam ¹
Innovating through “Interesting Times” in Global Health	<i>The Lancet</i>	Michael Merson ¹
Implementation of Policies to Protect Planetary Health	<i>The Lancet Planetary Health</i>	Subhrendu Pattanayak ¹
Stillbirths: The Hidden Burden of Malaria in Pregnancy	<i>The Lancet Global Health</i>	Steve M. Taylor ¹
Suicide Clusters among Young Kenyan Men	<i>Journal of Health Psychology</i>	Eve Puffer ¹
Study Protocol for a Cluster-Randomized Trial to Compare Human Papillomavirus Based Cervical Cancer Screening in Community-Health Campaigns Versus Health Facilities in Western Kenya	<i>BMC Cancer</i>	Megan J. Huchko ¹
Modality of Primary HIV Disclosure and Association with Mental Health, Stigma, and Antiretroviral Therapy Adherence in Tanzanian Youth Living with HIV	<i>AIDS Patient Care and STDs</i>	Elizabeth L. Turner ¹ , Coleen K. Cunningham ¹ , Dorothy E. Dow ¹
How many lives are at stake? Assessing 2030 sustainable development goal trajectories for maternal and child health	<i>The BMJ</i>	Gavin Yamey ¹
Pigs, Pathogens & Public Health	<i>The Lancet Infectious Diseases</i>	Gregory Gray ¹
Household air pollution is associated with altered cardiac function among women in Kenya	<i>American Journal of Respiratory and Critical Care Medicine</i>	Anubha Agarwal ² , Eric J. Velazquez ¹ , Gerald S. Bloomfield ¹
A human monoclonal antibody prevents malaria infection by targeting a new site of vulnerability on the parasite	<i>Nature Medicine</i>	Barton Haynes ¹

NOTES: (1) DGHI faculty; (2) DGHI scholar/fellow; (3) DGHI student/graduate; (4) Duke faculty/staff

Center Highlights



Center for Global Reproductive Health

- Launched in March 2018 with headquarters at DGHI and a field office in Kisumu, Kenya.
 - Gained a better understanding of the health challenges on the ground and built partnerships with in-country collaborators and the Kenya Ministry of Health.
-



Center for Global Women's Health Technologies

- Completed submission to the FDA for the pocket colposcope (see story, page 11).
 - Enrolled patients in the United States, Peru, Kenya, Tanzania and Zambia in testing of the device. Started clinical investigations in Honduras and India.
-



Center for Health Policy & Inequalities Research

- Secured funding for 16 grants on topics ranging from use of mobile technology with pediatric cancer patients; enhancing PrEP adherence among young Thai men at high risk for HI; and addressing stigma among HIV patients in the southern United States
 - Worked with 46 students through two Bass Connections groups, one Data+ group, one dissertation and five thesis mentorships.
-



Center for Policy Impact in Global Health

- Led a new international study that showed which candidate medical products are in the pipeline for neglected diseases.
 - Developed a new financial modeling tool to estimate the costs to move candidates to product launch.
-



Duke Hubert-Yeargan Center for Global Health

- Worked toward building clinical and research lab capacity at its partner institutions, most recently in Sri Lanka and Moshi.
 - Provided diagnostic equipment to combat Sri Lanka's recent adenovirus outbreak.
-



Duke Kunshan Global Health Research Center

- Organized a national dissemination workshop in Beijing to review progress in achieving Sustainable Development Goals in China.
-



Global Digital Health Science Center

- 15 active grants, including significant funding from the National Institutes of Health
 - Projects and interventions promote behavior change and improve health outcomes related to obesity, hypertension, diabetes and women's health.
 - Outcomes from Track, a 12-month trial of a digital health weight loss intervention in a community health center system, will be published in 2018.
-



Global Health Innovation Center

- Launched the Accelerating Saving Lives at Birth and Evaluating Saving Lives at Birth projects, which aim to address critical challenges in maternal and newborn health.
 - Developed strong collaborations with DGHI Evidence Lab; Duke Margolis Center for Health Policy and Duke Center for International Development, among others.
-

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