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Global Health Matters

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ARTIFICIAL INTELLIGENCE IN GLOBAL HEALTH

Opportunity, Capacity, and the Path Forward

ARTIFICIAL INTELLIGENCE (AI) is rapidly transforming health research and practice, offering new tools to analyze data, improve diagnostics, and strengthen health systems. In my own work and personal life, I use AI tools regularly across a wide range of tasks, and I believe our staff, grantees, and trainees should become familiar with them and use them when appropriate. These tools are already changing how research is conducted, analyzed, and communicated, and those who learn to use them effectively will be better positioned to advance science and improve health.

> "CONSISTENT WITH THE MESSAGE OF THIS COLUMN, I USED ARTIFICIAL INTELLIGENCE TOOLS TO ASSIST IN ITS DRAFTING AND EDITING."

In my talks with early-career colleagues, I warn them that AI won't take their jobs, but someone who knows how to use AI might.

The potential impact of AI may be especially significant in low- and middle-income countries (LMICs), where shortages of trained health professionals and limited infrastructure constrain access to care. In such settings, AI has the potential to extend the reach of health systems in new ways. For example, algorithm-driven care models can support frontline health workers in diagnosing and managing common conditions. AI-assisted interpretation of imaging studies, such as chest X-rays or ultrasound, can help address shortages of radiologists. AI tools may also support patient counseling and education, providing tailored information and mental health support in settings where providers have limited time. While these approaches are still evolving, they illustrate how AI could help bridge gaps in human resources and expand access to care.

At the same time, recent work by my colleagues and me highlights both the promise and the challenges of AI in global health. In an analysis of the NIH portfolio, we found that just over 5% of NIH artificial intelligence-related projects focus on low- and middle-income countries. This is striking, given that many of the most compelling use cases for AI are directly aligned with global health priorities.

This imbalance matters from a perspective of fairness yet also practicality and precision. AI models trained primarily on data from high-income settings may not perform well when applied elsewhere. Ensuring both accuracy and relevance requires meaningful inclusion of data from LMICs, along with the capacity to analyze and apply those data locally. This is fundamentally a capacity issue. It is not enough to deploy AI tools in LMICs; we must ensure that the people, institutions, and data systems needed to develop and adapt these tools are able to do so in their own settings. Without such assurances, AI

risks being developed in one context and applied in another, where it may not perform as intended.

In discussions with colleagues and trainees from around the world, there is strong interest in using AI to address pressing health challenges. At the same time, access to data, training, and computational resources remains uneven. Expanding opportunities for researchers in LMICs to participate in AI development and evaluation will be critical, not only to ensure that tools are appropriate for local contexts, but also to foster innovation that can benefit health systems globally.

The growing use of AI also raises practical considerations related to cost, infrastructure, and sustainability. Some AI models require substantial computational resources, with implications for energy use and feasibility in resource-constrained settings. These concerns are particularly relevant in LMICs, where electricity and computing capacity may be limited. This has led to increasing interest in more efficient, "frugal" approaches to AI, developing models that are not only effective, but also affordable and energy efficient. As in many areas of global health, innovations designed for resource-constrained settings may ultimately prove to be more scalable and sustainable for all.

NIH's Harnessing Data Science for Health Discovery and Innovation in Africa (DS-I Africa) program provides one example of an approach that seeks to address these challenges. By investing in data science capacity, supporting African investigators, and fostering collaborative networks, the program is helping to ensure that AI-enabled research is grounded in local expertise and priorities. This includes not only generating and curating data but also training researchers who can develop and apply analytic tools in their own contexts.

Such efforts reflect a broader principle that has long guided Fogarty's approach to global health research: investing in people and partnerships is essential for achieving lasting impact. In the era of AI, this principle is more important than ever. Building capacity in data science, including representative data, and supporting local leadership will be critical to realizing the potential of AI to improve health outcomes globally.

Artificial intelligence has the potential to accelerate progress in global health, particularly in settings where human resources are limited. But realizing that potential will depend on whether we invest in the capacity, data, and partnerships needed to ensure that these tools are effective and accessible. Done well, AI can help extend the reach of health systems and improve health for all. Or, as I have told our staff, AI will take your job . . . not away, but to the next level.

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profile

Catherine Koofhethile examines a reagent in her lab.

Catherine Koofhethile
PhD

Fogarty Fellow
2020-2021

U.S. Institution
Harvard T.H. Chan School of Public Health

Foreign Institution
Botswana Harvard Health Partnership

Research topic
Assessment of inducible proviral reservoir in HIV infected individuals on long-term ART in Botswana

Current affiliation
Botswana Harvard Health Partnership

Courtesy of Botswana Harvard Health Partnership (BHP) Communications Department

Catherine Koofhethile's fellowship award from the Organization for Women in Science for the Developing World required her to study for her PhD in a different African country than her home country of Botswana. She chose South Africa for its proximity to Botswana, yet also so that she could remain at the epicenter of the HIV epidemic and affected communities. "I grew up at a time when we could see it happening in our villages. I went to the funerals of relatives and neighbors who lost their lives to HIV/AIDS, because there was no treatment back then."

Koofhethile's PhD project at the University of KwaZulu-Natal examined the interplay between HIV and the immune system, a proposal stemming directly from what she'd observed—that some people could control the virus naturally without a need for treatment, while some people could not. The dream of helping to design a vaccine also shaped her hypothesis and project; she wanted her work to identify immune responses that should be elicited by (and included in) an HIV vaccine.

"But then I heard about the Berlin patient who was cured of HIV and I was like, 'Oh, I need to focus on a cure,'" says Koofhethile.

Chasing a cure

CD4 T cells are immune cells that help clear infections from the body, Koofhethile explains. HIV likes to infect CD4 T cells, which then often die either because the infection causes them to rupture or because of attack by other immune cells. A small proportion of CD4 T cells, despite being infected by HIV, do not actively produce new HIV particles; they go into latency, as scientists say. In these cases, HIV acts as a provirus, meaning it weaves its DNA into the genetic material of the host cell so that when the cell replicates, the HIV provirus passes with it from generation to generation. These sleeper cells are well-hidden, scattered throughout the body, with the immune system unable to recognize (and kill) them and treatments unable to sweep them from the body. This collection of latently infected cells is what scientists call a *reservoir.*

Koofhethile's postdoc work, funded by Fogarty's LAUNCH program, aimed to understand HIV reservoirs as a way of contributing to the development of a cure.

Koofhethile says, "I remembered a cohort in Botswana from a long time ago—the prevention of mother to child transmission cohort. Unfortunately, a small proportion of the babies did acquire HIV from their mothers and soon after birth began treatment." When she started her project, these children were now teens who'd been taking antiretroviral therapy (ART) for more than a decade. Was it possible, given that they'd started treatment so early and been on it consistently for years, these teens might be cured?

To answer this, Koofhethile's experiments induced latently infected cells taken from the teens' blood samples to see if the inactive proviruses could replicate competent viruses. Despite great hope and strong research, her results showed that the virus in the reservoir—although suppressed and undetectable for more than a decade—could still replicate and cause potentially life-threatening illness.

"I was so disappointed!"

Lemonade

This was not the only setback Koofhethile experienced during her Fogarty fellowship year, which happened to coincide with the COVID-19 pandemic lockdown. "I wasn't able to go to Botswana to collect samples and I couldn't work in the lab for a couple of months." She also contracted COVID, though she didn't become severely ill. Stuck at home in Boston for weeks on end, she researched and

Botswana Harvard Health Partnership

applied for grants. Once lockdown restrictions loosened, she used her Fogarty connections and mentors to start collaborations with nearby organizations. "Collaborators at the Ragon Institute gave me quite a lot of training and work to do." She worked with scientists there on reservoir analyses in a cohort of infants living with HIV-2 (a different form of HIV) from Mozambique, and generated data and publications characterizing the latent reservoir in the participants. She also attended "lots and lots of courses" through the Harvard Catalyst Mentorship Program to learn cutting-edge technologies.

Koofhethile's grant-writing efforts also proved fruitful. Smaller awards enabled her to present her work at different international conferences where she met experts in the field who gave her pointers and advice on how to manage her research. "The data that I generated, the grants that I won, all the thinking that I did at the time—all of it prepared me for moving back to Botswana."

Fellowship outcomes

Her Fogarty year undoubtedly helped establish Koofhethile as a cure researcher, yet once she returned home she worked hard to advance her research. Her preliminary data from Fogarty enabled her to obtain funding from Johns Hopkins CFAR (Center for AIDS Research) to begin exploring immune responses. She transferred some of the new technologies that she learned in Boston to Botswana and helped train younger scientists to use them. "Trainees on my projects can work without me looking over their shoulder." She also helped two students obtain Fogarty support.

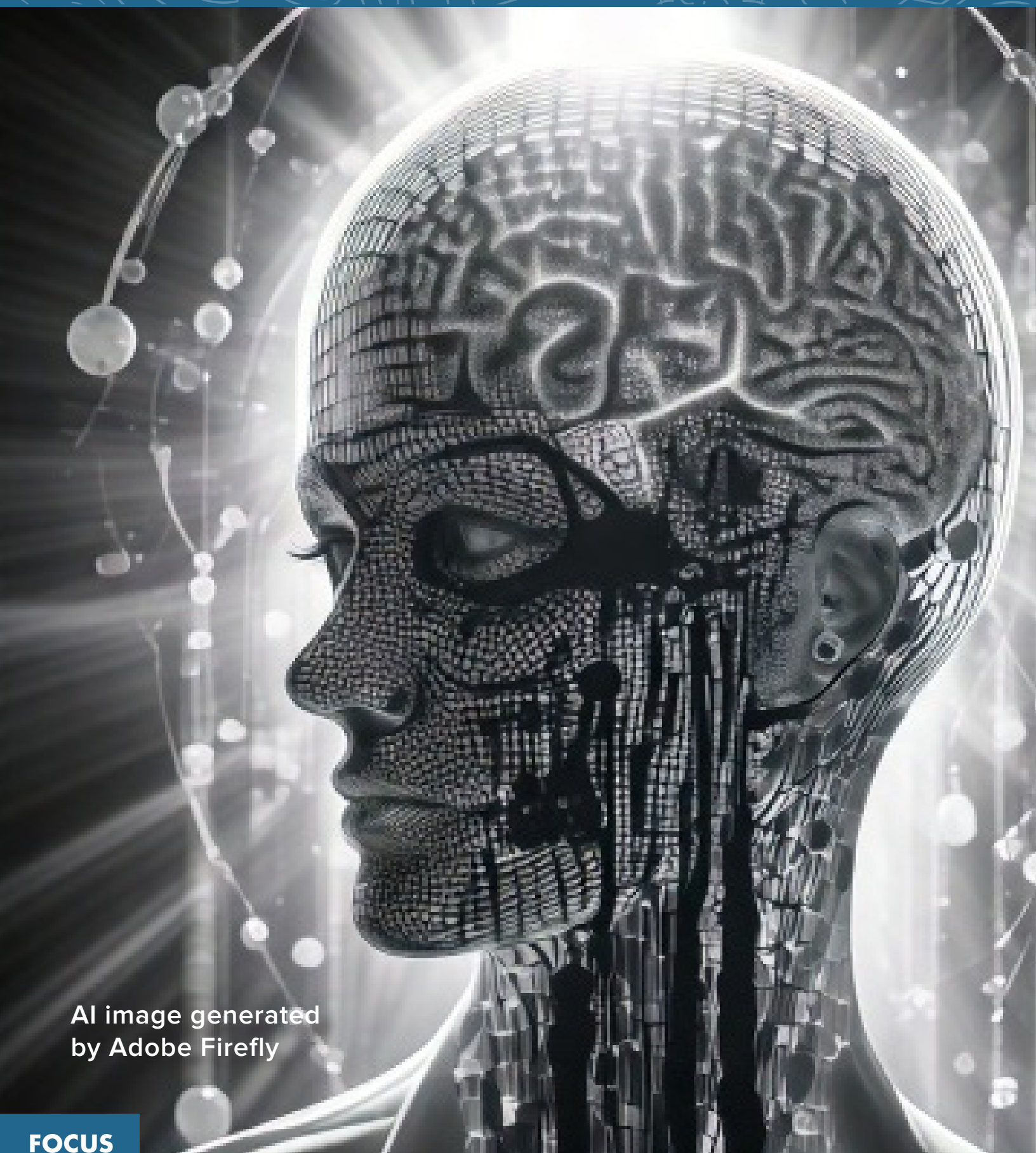
Another point of pride: Botswana's government (Ministry of Communications and Innovation) provided some necessary funding to help Koofhethile expand locally while sponsoring trainees. Meanwhile, she applied for and won other awards.

Koofhethile is now in her second year of a five-year Fogarty Emerging Global Leader Award. "A longer-term grant gives you security and lessens a lot of the pressure." Her award provides salary support, so she's diverted some of her funding to her students and to enrollment of a cohort of teens on long-term ART. "I started establishing a cohort once I realized that if you have full control, then you can do anything you want. I can apply for a grant and say, 'I have the samples, I'm trained, I've also trained other people, I have preliminary data to demonstrate that the work is feasible, and I have the cohort to complete it.'"

Koofhethile's research delves into HIV reservoir dynamics

Photo's courtesy of Botswana Harvard Health Partnership (BHP)

The Ethical Use of AI Tools



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FOCUS

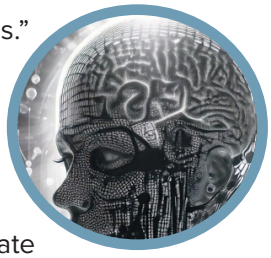
in Global Health Research

ARTIFICIAL INTELLIGENCE (AI)—THE GENIUS OFFSPRING OF MATHEMATICS, STATISTICS, COGNITIVE SCIENCE, AND COMPUTER SCIENCE—is a set of technologies that simulates learning, reasoning, problem-solving and other human cognitive functions. Developers design AI models to synthesize massive amounts of information and perform tasks that typically require human intelligence. Their successes, which work faster and with more accuracy than is possible for mortals, often inspire awe.

Across the globe, the fields of medicine and biomedical research are integrating AI tools into practices, procedures, experiments, and analysis. In these pages, four Fogarty International Bioethics Research Training Program grantees discuss the ethical concerns surrounding the use of AI in medicine and research in low- and middle- income countries (LMICs).

What makes the use of AI tools in global health research ethical?

The accepted framework for evaluating the ethics of clinical research studies consists of seven requirements: social or scientific value of the research; scientific validity (rigor of a study's design); fair subject selection; a favorable risk-benefit ratio; independent review; informed consent; and respect for enrolled participants. "Fulfilling all seven requirements is necessary and sufficient to make clinical research ethical," write the NIH-affiliated authors in a landmark paper published in 2000 in the Journal of the American Medical Association. A few years later in The Journal of Infectious Diseases, the same authors declare that, within developing countries, an additional "collaborative partnership" requirement is needed alongside the original seven obligations. Partnership with LMIC researchers, policy makers, and communities "helps to minimize" the possibility of misuse by ensuring that they determine for themselves whether a proposed study is "acceptable and responsive to the community's health problems."



Fogarty ethics program principal investigators agree that the utilization of AI tools in global health research needs to align with the existing standards, yet each acknowledges that AI is an exceptional technology with unique ethical considerations.

For instance, ethical use would require an AI model be accurate and produce reliable results when applied to LMIC study participants and patients, says Icahn School of Medicine at Mount Sinai's Rosamond Rhodes, PhD. Otherwise, the scientific validity of a proposed study and its risk-benefit ratio might not accord with existing standards. AI models trained on higher

income country population data do not necessarily correlate to LMIC populations due to differences in the genetics and medical histories of the two populations, explains Rhodes. “All the vaccines you’ve had in your life make you biologically very different from people who are naïve [never had a vaccine]. And, once you’ve been treated with many different antibiotics, you’re a different kind of person than someone found in a country where antibiotics aren’t used.”

Vina Vaswani, MD, agrees that the application of an AI tool within a global health research context is only ethical if accuracy and appropriate use have been verified, since “AI is only as good as its algorithms and its data.” She questions whether a “one-size-fits-all AI model” would ever work effectively in research conducted globally, or in India specifically with its many, diverse populations. Henry Silverman, MD, asks, “Is an AI model operating on a robust dataset that includes contributions from LMICs or is the dataset predominantly biased?” The answer to that one question will usually determine whether use of AI within a particular research context is ethical or not.

Cheryl Macpherson, PhD, says she’s uncomfortable with the possibility of AI “hallucinations,” where a large language model creates nonsensical or inaccurate outputs. “Misinformation is a major problem during AI use but also at the development stage.” She asks, Can researchers be certain that “hallucinatory” information has not been baked into an AI system in its formative phase, which might then invalidate any outputs related to all or parts of the research resulting from its use?

Another ethical point for consideration is whether end users, including researchers, fully understand how to operate and deploy AI, says Rhodes. “When I get some new software, I just want to use it and I don’t bother reading all the instructions,” she says. If someone’s life is on the line, then end users certainly need to be trained and tested. A researcher’s comprehension of AI tools is equally important, since the faulty deployment of an AI model within a research context could lead to inaccurate results, false conclusions.

Is it ever possible for a researcher to attain a thorough understanding—or thorough-enough understanding—of an AI system to be certain of its ethical use within a study? Vaswani observes that end users often “don’t know how a particular AI program was trained.” Given “the opacity of AI systems” operating as “black boxes,” she adds that doctors and investigators may find it difficult or even impossible to trace or explain to patients and research participants the rationale behind AI outputs. Can research participants truly provide informed consent?

Common uses of AI in LMICs

Writing assistance is possibly the most common application for generative AI among researchers and students. Macpherson believes authorship, and the possibility of plagiarism, are central ethical concerns. “How do you stop students from inappropriately using AI while encouraging them to use it wisely and for the right tasks?” Silverman agrees, yet believes authorship problems have existed long before AI. As Silverman notes, “the research integrity climate of the university enhances or diminishes the prospect for research misconduct.”

Silverman asks his students to state how they used AI in their research and mostly they respond, “I had AI help organize my thoughts. I used AI to polish my writing.” These uses of AI are fair, yet he wonders, “Do you list AI as an author? I think the short answer is no. But if the whole paper is generated by AI, maybe the short answer is yes.” Despite finding AI “helpful” as a writing assistant, he cautions, “If students depend too much on AI, they’re not developing their skills in critical thinking and in writing.”

Another ethical talking point is AI note-taking, says Silverman. This practice, which is increasingly common in clinical settings worldwide, has implications for both patients and researchers. “Are the notes AI-generated? Are they accurate?” Patients “can live or die by medical records, plus insurance companies may not reimburse based on an inaccurate

CREEi participant Andrea Kanneh gives a presentation on AI research ethics.

record." Imprecise notes might also falsely influence research outcomes and analysis.

Finally, AI is reading x-rays and other scanned images across the globe, while many hospital systems, especially intensive care departments, depend on AI-generated algorithms to direct care. In such cases, these systems provide real benefits, even while raising thorny issues of responsibility and accountability, says Silverman. What happens when things go wrong? Vaswani writes in a recent paper, "Identifying who bears responsibility, whether the developers, users, or the AI itself, remains a contentious ethical dilemma." Or, as Rhodes says, "You can't hold a computer program responsible."

Applied ethics

The field of research ethics and Institutional Review Boards (IRBs), in particular, play an important role in research oversight. In LMICs, a research ethics education helps local scientists contribute to the discussion of global studies from a position of knowledge, says Macpherson. Former trainees of her program are now IRB members, who examine study design, analyze the risk-benefit ratio, and consider the potential for harm to participants, among other tasks. Rhodes says, IRBs need to question whether there are unusual risks when AI is introduced into study design and implementation. She asks, "Can an AI model cause harm if it's applied to a lot of people all at once… or if it's not used in the right way?"

IRB members not only oversee how researchers are using AI in their studies, they are also using AI to execute their own duties. (Consider that: AI programs assist in the ethical review of AI-enabled research.) Silverman is currently working with colleagues in Cairo to develop a study to demonstrate the efficiency of AI reviewing protocols.

Macpherson explains her concerns: "Usually a clinical trial is sponsored by either a commercial interest or a government with biosecurity and other significant interests. Once you feed that information into the AI system, it's no longer confidential, even if you tell the AI to keep it confidential." Such fears are not unfounded; many users have received incorrect responses from an AI program that has clearly strayed beyond the data specified. "The confidentiality of an individual study subjects' data may be lost, so that's a potential harm to them as well as to the study sponsors and their own interests, whatever they may be," says Macpherson.

Silverman understands that "there are no firewalls for data security" when it comes to "downloading to ChatGPT." Still he believes the review of research protocols, which do not include patient data or confidential information, is "a different ballgame than uploading publishable papers." His apprehensions align with Macpherson's. He wonders, "If peer-reviewers use AI, are they putting the data out there for anyone to grab?"

Dr. Henry Silverman teaches in Morocco.

Courtesy of Henry Silverman

Guard rails

AI is evolving within an uncertain regulatory ecosystem despite well-known pain points, such as AI model drift, where performance deteriorates over time due, in part, to changes in data (a phenomenon described by IBM). Are oversight mechanisms needed to mitigate ethical risks when AI is deployed within the space of global health research?

"Every research ethicist would say we need to regulate this—even those who're strong proponents of AI. But if you look at the world today, there's a real unwillingness to regulate," says Macpherson. She adds that this lack of laws "opens us up to a lot of potential challenges and threats" to research ethics as well as human health.

When discussing legal parameters, some of the larger ethical issues include "who's going to participate in the regulation and governance of AI," says Silverman. He worries the AI revolution will only increase the digital divide between higher and lower income countries. "The main complaint I get from people in LMICs is that they can't afford the monthly cost."

Rosamund Rhodes, PhD

More than three decades ago, Icahn School of Medicine at Mount Sinai first hired Rosamond Rhodes, PhD, to teach medical ethics. "I am a philosopher, so I do medical ethics from a constructivist perspective," she explains. By constructivism, she means "we start with facts and then move towards principles and that makes it very compatible with medicine, which also starts with the facts." (A doctor learns a patient's symptoms before providing a diagnosis and then recommending a treatment.)

Along with teaching medical ethics in the U.S., Rhodes, who is now a professor at Icahn, helped established two Fogarty-supported research ethics master's programs beginning in 2012. One is in Belgrade, Serbia, the other, in Cluj-Napoca, Romania. "These programs aim to instill an understanding of ethics of research in the people who will serve on institutional review boards (IRBs) and as faculty and also as clinician researchers," she explains. The first program in Belgrade trained participants from the Balkan region and seven different countries, including Romania and, in particular, Cluj-Napoca, which is a "tiny little village in a valley in Romania that has 10 universities where they educate people from around the world, teaching simultaneously in many different languages." Graduates of the Belgrade program serve as faculty in Cluj-Napoca.

Both programs teach standard research ethics and provide the historical background of clinical trials, going back to the 17th century, says Rhodes. The curriculum touches on key ethical topics, such as the importance of institutional oversight, risks and benefits of research, informed consent, therapeutic misconceptions, and inducements for investigators. "In Belgrade, we did a survey of clinician researchers to find out what kind of education they've had in research ethics and what they want to know more about and AI kept popping up," says Rhodes.

Over the past few years, Rhodes has extended her scope, via a secondary appointment, into "the AI and human health research unit at Mount Sinai where I work with people on the ethical concerns involved with AI use in medicine." Though she's quick to say she's no expert in AI, Rhodes believes the principles guiding the ethical use of AI in global health research need to align with the existing ethical framework formulated for all research.

She notes that science is "doing away with a lot of informed consent by way of public health surveillance." During COVID, for instance, scientists collected sewage sludge to find out which communities had more infections. No informed consent is needed for this type of research. "You might be embarrassed if, say, you live in Scarsdale, and they find out that there's more COVID in Scarsdale and now maybe somebody won't invite you to their New Year's Eve party. But beyond that, there's no risk from the research, so informed consent is not required."

"Risks to participants, that's where the emphasis should be for research ethics," says Rhodes. "We need to follow the facts."

"RHODES SAYS RISK AND THE POTENTIAL HARM TO RESEARCH SUBJECTS, ACCOUNTABILITY, AND RESPONSIBILITY ARE THE MOST IMPORTANT ETHICAL ISSUES IN RELATION TO AI USE IN RESEARCH, "WHEREAS CONCERNS ABOUT CONFIDENTIALITY, TO ME, ARE LESS IMPORTANT ELEMENTS."

Cheryl Macpherson, PhD

Cheryl Macpherson, PhD, and the entire Caribbean Research Ethics Education Initiative (CREEi) team recently discovered how helpful AI tools can be when it comes to translations. Still she wonders, Can the Caribbean research community continue to use AI to its best advantage while remaining clear-sighted about its potential for harm?

Since 2014, CREEi has built research ethics capacity in many of the independent, low- and middle-income countries that border the Caribbean Sea: Antigua and Barbuda, Belize, Columbia, Costa Rica, Cuba, the Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panamá, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. "We're really proud of the fact that CREEi works across all these countries, simultaneously in English and Spanish languages," says Macpherson, professor emerita at St. George University of Medicine in Grenada and a senior research fellow at the Windward Islands Research and Education Foundation.

CREEI's certificate and Master's-level programs were developed by a partnership of three universities: St. George's University, Universidad Autónoma de Querétaro in Mexico, and Clarkson University in the United States. For its first cycle, CREEi developed one instruction package for the Spanish-language countries and another for the English-language countries, the latter overseen by Macpherson. In 2020, the program "united the two arms, teaching them together," and providing all program materials in both Spanish and English and allocating one Spanish- and one

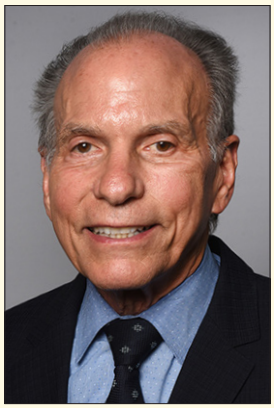
English-speaking faculty to each course. During this transition to a bilingual model, CREEi faculty used AI-assisted translation tools, yet still "reviewed and refined" all translations to ensure accuracy and cultural sensitivity. In this way, they modeled responsible use of AI for their students. "AI also helped the fellows to communicate across languages," says Macpherson. A review she co-authored for the *International Journal of Ethics Education* notes, "Students interacted widely in discussion forums, often responding to peers in their non-native language."

The Caribbean context is complex, with some countries appearing more valuable for a given research study than others when it comes to providing statistically robust data, says Macpherson. English-speaking countries have smaller populations and qualify less often for large, multi-site trials compared to the more populous, Spanish-speaking countries. They also have fewer IRBs that meet international standards than their Spanish-speaking neighbors. Regionally, some hope that AI may help ease the burden on IRBs, so they can be more efficient. "Fundamentally, they're all overstretched," says Macpherson.

CREEi graduates now sit on research ethics committees and "some are concerned about AI issues in research ethics, because we've trained them to think critically about developments and advances," says Macpherson. "It's huge to have people who genuinely understand research ethics at North American and international standards in positions where they can help their countries and institutions."

"ALL NATIONS FACE SIMILAR ETHICAL ISSUES REGARDING THE USE OF AI IN RESEARCH, SAYS MACPHERSON. "BUT LMICs ARE MORE VULNERABLE TO ITS POTENTIAL MISUSE THAN HIGH INCOME COUNTRIES BECAUSE THEY'RE PERHAPS MORE EAGER TO BENEFIT FROM IT... THEY MAY BE MORE WILLING TO TAKE THAT LEAP."

Henry Silverman, MD



Henry Silverman, MD, a professor of medicine at the University of Maryland School of Medicine, serves as the principal investigator for several Fogarty-sponsored research ethics training programs. His original grant in 2004 focused on Egypt, then in 2014 he extended this program across the Arab Middle East. In 2017, he developed a program for Myanmar, another for Morocco in 2025. Since 2022, he's served as co-investigator for a Fogarty ethics program in The Gambia.

During the past year, Silverman has organized workshops focused on the ethical use of AI tools in research. "The workshops demonstrate how to use AI tools and how to ensure the trustworthiness of those tools. We also look at which AI tools are best." Silverman says, "There's a fine line between generating knowledge versus generating content. If you just take, word for word, the AI output, that's content—maybe accurate, maybe inaccurate content." Generating knowledge requires interacting with AI, challenging the answers it gives you, probing it to attain a richer understanding of a topic. In this sense, responsible use of AI depends on preserving the researcher's *epistemic agency*—the capacity to critically evaluate, interpret, and justify the claims being made, says Silverman. "I enjoy brainstorming with AI. When you go back and forth, it can sharpen your thinking and help you develop your own understanding of a topic."

Silverman sees several ways in which AI tools can enhance research development in lower-resourced regions. There are so many articles published now that it's nearly impossible to do an adequate literature review. "New AI tools find all relevant articles and capsulize the results and findings." He and his colleagues recently conducted a study of peer-reviewed journals and found that a major reason why some researchers don't get published is lack of novelty. "If you're not able to understand where the gaps are in research, then your research is not going to advance the field or be exciting," says Silverman. He adds, there are special AI tools to help investigators recognize the research gap.

AI can also help researchers with their writing by enhancing sentence structure and logical flow. "A peer reviewer sees

difficult writing and automatically assumes that the research is no good and rejects it," says Silverman. He's developed workshops on scientific writing "that really get into the nuts and bolts."

Silverman believes he's fortunate to receive Fogarty funding and feels confident his programs have brought about change and improvements. Former trainees now conduct important research and publish articles, some are chairs or vice chairs on institutional research ethics committees, and many serve in the government overseeing their country's research ethics enterprise. One colleague established a network of more than 50 research ethics committees in Egypt. "My plan in Morocco is to develop a diploma and a master's program in research methodology and ethics, and then build a similar regional network."

"I TELL MY STUDENTS I USE AI AS MY ASSISTANT, BUT *I'M* THE FINAL AGENT WHO IS ACCOUNTABLE. AND THAT'S ALL THE DIFFERENCE IN THE WORLD."

Vina Vaswani, MD

On December 3, 1984, more than 40 tons of methyl isocyanate gas leaked from the Union Carbide India Limited pesticide plant in Bhopal, India. The plume immediately killed at least 3,800 people and a total of 10,000 people died over the first few days, according to a 2005 paper published in *Environmental Health.* Up to 20,000 premature deaths occurred in the subsequent two decades.

"At that time I was in year one of my medical degree," says Vina Vaswani, MD, a forensic medicine specialist at Yenepoya University. Two people showed up at the medical college hospital, nearly 600 kilometers from Bophal. After boarding a train, they'd lost consciousness, so strangers brought them to the hospital. Years later, Vaswani worked with victims of this tragedy who received treatment as participants in a clinical trial. "When I asked, 'Do you know this is part of research?' They said, 'No.'" This is typical of Indian research at that time, she says. "Doctors said, 'If it works out, it will be for their benefit, so you don't have to tell patients it's research.'" Also at that time, forensic professionals taught ethics because they were part of the jurisprudence system. A forensic doctor herself, Vaswani taught the code of ethics, which essentially meant training doctors to avoid negligence charges. "I said, surely this can't be ethics, because who is at the center of activity? A doctor, not the patient."

Wanting to learn more, Vaswani looked to Europe. She came across the Erasmus Mundus program, an EU initiative to foster international collaboration, which offered a year-long ethics program at three European universities. A few years after Vaswani completed the program, her medical college became a full university (Yenepoya) and established a Center for Ethics. Along with performing autopsies, she began to teach bioethics.

"We began a collaboration with Johann Gutenberg University in Germany, and started a postgraduate diploma program in clinical ethics," Vaswani explains. In 2014, she and her colleagues wrote an NIH grant application. "We were quite naïve, but somehow we made it happen." The Yenepoya University-Fogarty International Center Research Ethics Master's Program taught students foundational bioethics and answered basic questions about respect, human dignity, and autonomy of patients. It ran from 2018 through 2023.

Vulnerability is the focus of Vaswani's ethics. "Educating a patient or a study participant is one of the most important duties of a doctor or a researcher. And if you're on an ethics committee, you are the last bastion, so you must make sure that there's justice and no exploitation of study subjects." Today, biomedical research ethics in India are good, still "AI is a black elephant in a black room with five blind men feeling it with their hands and each explaining a part but thinking it's the whole."

"VASWANI FEARS A RELIANCE ON AI COULD CAUSE A "TRUST DEFICIT" BETWEEN DOCTORS AND PATIENTS. "PATIENTS COME FOR HEALING, WHICH IS THROUGH TOUCH, THROUGH DIALOGUE. MANY PATIENTS ALREADY FEEL THAT NOBODY EXAMINED THEM THOROUGHLY."

Photo courtesy of José Felipe Batista/Comunicação Butantan

Brazil produces a single-dose dengue vaccine developed at NIH

A quarter century of hard work has paid off for the National Institute of Allergy and Infectious Diseases (NIAID). In December, the Brazilian Health Regulatory Agency approved the world's first single-dose dengue vaccine, which is based on the research and clinical development of NIAID scientists. Brazil's Instituto Butantan has begun production of the new vaccine—known as Butantan-DV—and plans to deliver roughly 100 million doses to the country's Ministry of Health over the next three years.

Dengue fever is a mosquito-borne illness endemic in Brazil and widespread in tropical regions worldwide. Some refer to it as 'breakbone fever,' because it can cause severe aches and pains in the legs, joints and back.

Butantan-DV is "a live attenuated vaccine, which means it provides long-lasting immunity, and its production is cost effective," said NIAID's Dr. Stephen Whitehead, the lead inventor of the dengue vaccine technology, in a recent podcast. He explained that dengue virus has four serotypes (or strains), so his team developed separate vaccine candidates for each. Next, his team selected the candidates that worked best, tested them for about a decade, and then put them together in a single inoculation. "We're getting complete immunity against all four serotypes after the single dose."

This is important. After recovering from an infection of dengue, individuals have long-term immunity against the serotype that infected them, but only two-to-three-month immunity against the remaining three serotypes. If they become infected with any of those three strains after their immunity wanes, they're at higher risk of developing a more severe version of the illness than if they'd never been infected at all.

'Powerful weapon'

Butantan, an organization linked to SãoPaolo State Department of Health, completed a five-year efficacy study and evaluated the vaccine in more than 16,000 volunteers living in 14 Brazilian states. In this study, Butantan-DV demonstrated nearly 75% efficacy overall, with 91% efficacy against severe dengue and 100% efficacy against dengue hospitalizations. Serious side effects were rare, most of the adverse reactions reported were mild to moderate, such as pain and redness at the injection site, headache, or fatigue.

Brazil's Ministry of Health estimates that, since the beginning of the 2000s, more than 20 million Brazilians have been affected by the disease. Each year, up to 400 million people are infected worldwide, according to the U.S. Centers for Disease Control and Prevention.

"A disease that has afflicted us for decades can now be confronted with a very powerful weapon: the single-dose vaccine from the Butantan Institute," stated Esper Kallás, MD, director of the Butantan Institute, in a press release. Butantan-DV is approved for use in ages 12 to 59 and is expected to be included in Brazil's National Immunization Program.

NIAID has licensed the vaccine technology to several companies and institutes in addition to Butantan for late-stage clinical evaluation and commercial development. Phase 3 trials are already underway for the vaccine in Southeast Asia (Merck) and India (Panacea Biotec), with Serum Institute of India planning to begin a new study in 2026.

"It is a success story both for the science and technology transfer," said Whitehead.

Stephen Whitehead

Photo of Stephen Whitehead /Courtesy of NIH

"A DISEASE THAT HAS AFFLICTED US FOR DECADES CAN NOW BE CONFRONTED WITH A VERY POWERFUL WEAPON: THE SINGLE-DOSE VACCINE FROM THE BUTANTAN INSTITUTE."

Michèle Ramsay, PhD

Q&A

Africa's remarkable genetic diversity yields benefits for people worldwide

Michèle Ramsay, PhD, is the Director of the Sydney Brenner Institute for Molecular Bioscience and Professor in the Division of Human Genetics, University of the Witwatersrand (Wits), Johannesburg. Her research interests include African population genetic diversity and its contribution to history, health and disease. She is committed to good data governance to ensure that continental African populations can benefit from precision medicine and health approaches to improve life and wellbeing, and to capacity strengthening in genomics and bioinformatics in Africa. She is principal investigator of the NIH-funded Collaborative Center under the Human Heredity & Health in Africa (H3Africa) Consortium and co-investigator for the MADIVA (Multimorbidity in Africa: Digital Innovation, Visualisation and Application) research hub of the NIH-funded Data Science for Health Discovery and Innovation in Africa (DS-I Africa) program. Ramsay served as president of the Southern African and African Societies of Human Genetics and the International Federation of Human Genetics Societies.

You studied human genetics. Why?

When I went to university, I did courses in botany and zoology and one of the joint modules was genetics. By the third lecture, I was totally smitten. Since Stellenbosch University only offered a major in genetics in the Faculty of Agriculture, I started off with animal and plant genetics before doing a master's in microbial genetics. Only when I got to the PhD level did I get exposed to human genetics and that's when I realised that this field is my home.

Why is genetic diversity greatest among African populations?

Our species, Homo sapiens or anatomically modern humans, arose on the continent of Africa about 300 to 400 thousand years ago. The evidence suggests that the origin of modern humans didn't happen in just one place in Africa, but likely occurred in multiple regions and involved considerable migration and intermixing. Throughout this period, novel genetic variants arose and recombination events accumulated, and there was selection for specific variants due to exposure to environmental factors, including diet, extreme weather, infectious pathogens, and cultural practices. These elements together with random drift added to the diversity of genomes in African populations.

Then, from about 70 thousand years ago, different waves of migration from the continent began and each wave took just a small part of the genetic variation with it. Most of the variation remained in people living in Africa today. This is why populations in Africa have such high genetic diversity.

How did your work on H3Africa contribute to your own scientific growth?

H3Africa has had an immense influence on my career. When the funding call came out we formed a brainstorming group at Wits University and as one of the human geneticists in this group, a senior colleague said, "You're the right person to lead this." This was the start of what became a four-country collaboration and evolved into what we later named the AWI-Gen study, the Africa Wits-INDEPTH (International Network for the Demographic Evaluation of Populations and Their Health) Partnership for Genomic Research. The primary aim was to examine genomic, environmental and behavioural factors influencing body composition and cardiometabolic diseases in African populations. We were one of the eight founding projects and attended the inaugural H3Africa meeting in Addis Ababa, Ethiopia, in August 2012. This was the first time that the AWI-Gen team members from Burkina Faso, Ghana, Kenya and South Africa met in person.

For the first five years, I was co-principal investigator with Osman Sankoh, DSc and INDEPTH director based in Ghana. He taught me a great deal about managing international research collaborations and partnerships. During the second funding period new partners joined the AWI-Gen study and we performed a

Photos courtesy of Michèle Ramsay

The MADIVA team meets with health workers in Mpumalanga, South Africa—Ramsay is a co-principal investigator on this NIH-funded Data Science for Health Discovery and Innovation in Africa project.

second wave of data collection and included a sub-study on the human microbiome. The gut microbiome study was the first and largest in Africa, generating data from 1800 continental African participants and revealing thousands of novel bacterial and viral species. The resulting paper was published in 2025 in *Nature,* which featured it on its cover with beautiful African artwork. The funding for AWI-Gen came to an end in 2024, but we keep working on this extraordinary project that has been the catalyst for new studies and many new ideas.

What makes you most proud?

The small part I have played in enabling the next generation of African genomicists. Our scientific outputs and our papers are meaningful and important in generating incremental knowledge, but the people whose careers we promote along the way are most important in making a meaningful difference, since they build on and amplify the work that we do.

Many of my former students have left South Africa and I'm so proud that they're working on the international stage. I also feel sad that we've had to say goodbye. Many in the African diaspora feel a responsibility toward building scientific capacity on the continent and they have been incredibly supportive of the work that we do.

Just last week, we had a workshop on the genetics of kidney disease in Africa and during dinner I spoke to a young Nigerian scientist who's now working in the UK. When I heard his story, I understood that it would be almost impossible for him to do in Nigeria what he is doing now in the UK. Still, he's thinking about helping those who are still there, by hosting students, working in partnerships, and getting collaborative grants. Probably he'll have more impact in Africa from the work he does in the UK.

Why is it important to study genetics in Africa?

We can see interesting examples of genetic adaptation, and these can lead to solutions or therapeutics that are relevant to the rest of the world. For example, high cholesterol is very common among people in high income settings in Europe and North America, but not so much in Africa. Through work that was first done in the African diaspora and later in Africa, we've identified mutations in a gene called PCSK9 that are associated with naturally lower cholesterol levels. Over time we learned exactly what that mechanism is and this has led to a pharmaceutical intervention, PCSK9 inhibitors that significantly lower cholesterol. Today, this intervention is mostly used in European ancestry populations.

The more we study African genomes, the more we will discover in terms of novel therapeutic approaches and new ways of addressing health for everyone in the world. We need more than genetic data to do that. We also need health data, behavioural data, weather data, together with information about diet, infection patterns and cultural norms from different African regions. Then we need skilled researchers, including data scientists, working in Africa to make sense of this multimodal data and mine it for novel insights and opportunities.

Do you have any final words of wisdom for global health researchers?

African populations deserve to be studied in more detail because of the potential to benefit people worldwide. Our challenge, then, is getting data from different parts of Africa to capture the extensive genetic diversity across the continent. I wish to encourage industry and funding bodies to help us build meaningful and large-scale databases and to increase opportunities for Africans to lead the science, while recognizing that understanding the local environments and cultures is essential. Good science is so much more than just data! When you understand what's happening on the ground, you can better translate the work.

"FINALLY, I'M TRULY EXCITED BY THE BRIGHT YOUNG MINDS I GET TO WORK WITH IN AN ACADEMIC SETTING. WE NEED MORE ENTREPRENEURS WHO TRANSLATE THE WORK THAT WE DO INTO TANGIBLE PRODUCTS THAT BENEFIT COMMUNITIES. "

Improving treatment for people with serious mental illness in West Africa

"In 2017, I saw news coverage of the plight of people with serious mental illness in West Africa," says Dror Ben-Zeev, PhD, Professor of Psychiatry and Behavioral Sciences and Director of the BRiTE Center and the mHealth for Mental Health Program at the University of Washington. "I'm a pretty unflappable person, but seeing the footage of men, women, and children chained and shackled to concrete slabs or to trees—or being intentionally (physically) harmed—was jarring."

Eyes opened, he read widely about this topic and then traveled to West Africa. "During that trip, I visited stakeholders and met the person who became my co-P.I., Professor Angela Ofori Atta at the University of Ghana. We visited prayer camps and saw healers and their practices." With each encounter, he refined his ideas around what he, a digital health researcher, might do to make things better.

Sowing a project within a landscape

Ghana has a population of approximately 30 million people and an estimated 30 psychiatrists—one per million people. Prayer camps have become the "de facto providers of services to people with serious mental illness" because they far outnumber the trained psychologists, psychiatrists and social workers in the region, says Ben-Zeev.

Prayer camps, as the name suggests, are usually led by a religious figure, most often either a Pentecostal preacher (often referred to as prophet) or an imam, depending on the community or region. "The camps can be small mom and pop shops with only five or six patients on the property, or they can be quite large facilities with dormitories and dedicated units," says Ben-Zeev.

The care provided by the camps for mentally ill patients may consist of prayer services, herbal remedies, or, in cases where someone's behavior is disruptive, unusual or frightening to others, shackling and chaining. "Sometimes this form of containment comes with forced fasting and sometimes it comes with physical abuse—so chaining combined with flogging or beating." Abuse when it occurs may be intentional. "Some healers believe that creating enough distress to the body renders the vessel uninhabitable or less preferred by spirits."

Meanwhile, psychopathology prevalence rates in low- and middle- income countries are about the same as in higher income regions, but this may not reflect the true number of people struggling with mental illness, says Ben-Zeev. He believes the studies of depression and anxiety in Western Africa reporting lower rates than elsewhere may be flawed due to underreporting. "When it comes to severe conditions like psychosis, the general prevalence rates range from 1% to 4%, which is similar to the rest of the world."

Dror Ben-Zeev. PhD

This overall context shaped Ben-Zeev's decision to integrate his Fogarty-funded project, "Combining mHealth and nurse-delivered care to improve the outcomes of people with serious mental illness in West Africa," into the existing infrastructure of prayer camps. "If you want to improve something, you partner with the people on the frontline, the people who have the greatest possibility of taking useful ideas and deploying them and scaling them so that they actually reach patients' lives," he says.

Dual-pronged approach

Ben-Zeev's intervention begins with camp staff identifying candidates who "hear voices," "have visions," "communicate with spirits," or are either "sad, sullen, depressed" or "disruptive and aggressive," or "believe they have special powers that others do not possess"— behaviors indicative of serious mental illness. Selected patients are screened by his team's personnel and given the option of joining the study. The next phase of the intervention consists of psychoeducation, skills training, and treatment support tools delivered to camp healers via the M-Healer toolkit app, plus drug therapy administered

to patients by a Mobile Nurse, who manages treatment plans using evidence-based guidelines.

The project follows the protocols of a stepped wedge trial, a type of randomized study where all study sites start in the control condition and then crossover into the intervention condition at predetermined intervals. "All prayer camps eventually get exposure to the intervention."

"There's very little awareness around digital mental health in West Africa, certainly no formal training, so we also piloted the West African Digital Mental Health Alliance (WADMA) as a way to strengthen research capacity," says Ben-Zeev. WADMA invites researchers and other stakeholders to webinars hosted by expert speakers. The plan is to create formal training pipelines in the future. "Ideally all of this generates energy and traction and a community of people who can continue the work after the project is done."

Outcome & translation

The study, currently in its fifth year, began with an optimization trial to pilot-test the intervention. The trial demonstrated both feasibility and acceptability, and this may be the study's most important finding, says Ben-Zeev. "The idea of working with and through prayer camps is outside the box, so the fact that we can pull it off, with all the operational, logistical and ideological challenges, is not a trivial thing at all."

Early results also show statistically significant improvements in a small sample of patients—reductions in both symptom severity and violations of their human rights. Another finding: the mobile nurses are diagnosing comorbid conditions in their prayer camp patients. "We're seeing high rates of hypertension, malaria and other conditions and we're creating pipelines for referrals to district hospitals," says Ben-Zeev.

Some West African prayer camps, use shackling to detain mentally ill patients.

Photos courtesy of Dror Ben-Zeev

In addition to working in Africa, Ben-Zeev has been conducting mHealth research in the U.S. Patients with severe mental illness in Africa and America may be unalike in many ways but all of them experience symptoms that "impact their functioning, happiness, quality of life and their ability to work and live independently," says Ben-Zeev.

West Africa's traditional healers have impressed Ben-Zeev with their "willingness and ability to think outside the box, because reality demands it." The United States may be much better resourced compared to West Africa, but there's still a "constant deficit," so his team is interested in working "with and through" religious organizations in regions of the United States where the nearest clinic might be 50 to 100 miles away.

The M-Healer toolkit app was developed to support mental health care in West African prayer camps.

"CERTAIN COMMUNITIES WILL LOOK TO THE CHURCH TO BE THE FRONTLINE FOR PROVIDING SOLACE AND CARE, SO SOME OF WHAT WE'RE TRYING OUT IN WEST AFRICA IS POTENTIALLY ADAPTABLE TO AREAS IN THE UNITED STATES."

Feedback sessions share research results, including an 'eye-opening' finding

Research feedback sessions in Kenya spurred discussions of surprising results and unhealthy practices, say Timothy A. DeRouen Center for Oral Global Health researchers.

The team at DeRouen, which is part of the University of Washington (UW) School of Dentistry, shared their findings from a study of oral health in 3- to 4-year-old children. Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu County, Kenya, and some of its networked health clinics served as study sites. Health staff from the hospital and clinics, including nurses, medical assistants, physicians, and the clinic director, attended the sessions. "These are the people who really made things happen," says Principal Investigator (P.I.) Ana Lucia Seminario, DDS, PhD.

The shared findings included baseline assessments from the ongoing project, "Dynamics of HIV-infection, oral innate immunity and the development of oral diseases in children," which is funded by Fogarty's HIV-associated Noncommunicable Diseases research program and the National Institute of Dental and Craniofacial Research.

Surprising results

The study compares the oral health outcomes of three groups of children—those who are living with HIV, those who are HIV exposed and uninfected, and those who are unexposed and uninfected. ("Exposed and uninfected" refers to the children of HIV positive mothers who are born without the virus.) "One of the strengths of our study is that we were able to include a well-characterized and balanced cohort of children across all three groups," says Seminario, who is director of the DeRouen Center and professor of pediatric dentistry at UW.

The team's analysis showed that children living with HIV had more cavities and gum disease than the other two groups. By contrast, the group with the best oral health were the exposed and uninfected kids. This is an "eye-opening" finding, says Seminario.

The Kenyan team members theorize (based on their qualitative studies) that these kids do well in part because their families see them as special and so protect their health. "They call the HIV negative children born to HIV positive mothers 'miracle babies,'" says Seminario. Also, the mothers have become very good at following instructions to avoid passing the virus onto their children. (Mothers must maintain a strict drug regimen of antiretroviral therapy (ART) to prevent transmission during pregnancy; while breastfeeding, both mother and child are on ART.) This same diligence continues after birth, explains Seminario. "They've been very engaged in their child's health since before birth and they continue this after birth by taking their children to regular pediatrician checkups and being careful with their diets."

Unhealthy practices

During the well-attended feedback sessions, a co-P.I. on the project, Arthur Kemoli, DDS, PhD, explained the study results with assistance from the study's coordinator, Immaculate Opondo, DDS (Maseno University). Findings show high rates of HIV-related oral health conditions like oral ulcers, candidiasis, and warts among the children living with HIV. Attendees asked how to identify caries (cavities) and oral lesions, and they also wanted to hear useful information about the effects of these HIV-related conditions.

"If you have a blister as an adult, it hurts, but blisters in 3 or 4-year-old children impact the way they eat and even drink, possibly leading to poor nutrition and so poor growth," says Seminario.

Oral mutilation was another concerning topic for attendees. "It is believed in some rural areas that the canine teeth are somehow related to evil, so a shaman or spiritual leader will operate on children, basically opening the gums, going through the bone, and removing the canines," says Seminario. Often, these operations are performed with unsterilized instruments, so children can develop infections and, in some cases, end up in the hospital.

Dr. Ana Lucia Seminario (left) and Moureen Otieno (right) during study startup activities at Jaramogi Oginga Odinga Teaching and Referral Hospital in Kisumu, Kenya."

Photos courtesy of Ana Lucia Seminario

Kemoli, who is the former Chair of the Department of Paediatric Dentistry and Orthodontics at the University of Nairobi, is a strong advocate against this practice. He's gone from community to community to discuss the harms with local leaders. He and Opondo, whose PhD thesis focuses on the association between oral mutilation and HIV infection, addressed attendees' many questions on this and related health topics.

This transition from feedback session to a wider conversation about health is natural, says Dr. Frank Roberts, PhD, Associate Dean of Regional and Global Affairs at UW School of Dentistry. Worldwide, oral diseases are more prevalent than other diseases. "Everybody has had some experience with teeth problems. Talking about dentistry can open doors and lead people to think more generally about their health."

Dr. Jenipher Ober-Oluoch (far left), Dr. Frank Roberts (2nd from left), Dr. Arthur Kemoli (middle), Dr. Ana Lucia Seminario (front right), and Sara Stanley (back right) at the 2023 KEMRI Annual Scientific and Health Conference (KASH Conference) in Nairobi, Kenya.

Evidence-based practices

The team's ongoing analyses include testing and assessing saliva samples to better understand the oral microbiome. (The mouth harbors many microorganisms, including bacteria, fungi, viruses, and protozoa, collectively known as the microbiome.) An analysis of one salivary biomarker, a tiny protein known as LF37, which has antimicrobial properties has recently been completed. "The decrease of this tiny protein in the saliva precedes the development of new caries, new lesions, and that's absolutely a new finding because there has never been an opportunity to assess little kids longitudinally," says Seminario. (Her longitudinal study examines and reexamines each child at regular intervals over time, instead of collecting data from each child just once.) This study design enables the researchers to capture more data and helps them better understand the complexities of oral health. Seminario says that kids' mouths change so much around ages 3 to 4 years old, because "first they have no teeth, then they get their first teeth, then these teeth are lost and replaced by permanent teeth—there's a lot going on!"

Looking ahead, she believes the new data will provide the necessary evidence to sway the decision-making of pediatricians and dentists and advocates who hope to integrate oral health within HIV care. "We are over the moon because we have robust data."

Roberts is equally excited as Seminario, still he cautions that the greater challenge here is to influence community practices. "We need to help people take a new approach to oral care that is supported by this evidence. That's where implementation research comes into play." Without uptake of evidence-based knowledge, the same health problems will simply continue worldwide, including in the U.S., he says.

Seminario says, "Our work is helpful to Americans because we can bring this knowledge back to them." Whether research is done in Africa or America, dissemination of the results is always crucial, she adds. Scientists learn a lot when communities comment on study methodology and make suggestions for future engagement.

"WE RESEARCH A HEALTH QUESTION, WE COLLABORATE WITH THE COMMUNITY, AND THEN WE NEED TO BRING OUR FINDINGS BACK TO THE COMMUNITY. DISSEMINATION CLOSES THE LOOP OF THE RESEARCH PROCESS."

Dr. Immaculate Opondo (left) performing an oral exam in Kisumu, Kenya.

Community

Fogarty names Steven Smith acting deputy director

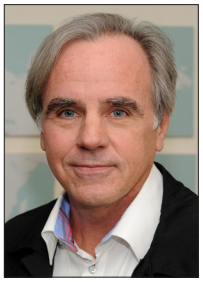
Steven T. Smith, who has worked for more than 20 years as a health diplomat for the U.S. government, is Fogarty's Acting Deputy Director. His most recent post was the United States Mission in Geneva, Switzerland, representing the National Institute of Allergy and Infectious Diseases (NIAID). In Geneva, he also represented the United States and the Department of Health and Human Services (HHS) in international negotiations and World Health Organization governing body meetings. Previously, he served as Acting Deputy Assistant Secretary in the HHS Office of Global Affairs, HHS Health Attaché to South Africa, HHS Health Attaché to India, Haiti Health Reconstruction Coordinator, director of the NIAID Office of Global Research, and PEPFAR Coordinator in South Africa. Prior to working at HHS, he worked as a State Department Foreign Service Officer in Cameroon, South Africa, and Haiti. Smith is a graduate of Amherst College and Columbia University, and he studied at the University of Nairobi.

Criswell steps down as NIAMS director

Lindsey A. Criswell, MD, DSc, has concluded her service as Director of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). As director, she contributed to advancing NIAMS' research into the causes, treatment, and prevention of arthritis, musculoskeletal, and skin diseases, while leveraging data-driven decision-making and AI tools to refine the institute's approach to funding and enhancing business operations. Criswell oversaw the projects for rheumatoid arthritis/lupus, autoimmune and immune-mediated diseases of the Accelerating Medicines Partnership, a public-private collaboration among the NIH, the U.S. Food and Drug Administration and multiple biopharmaceutical and life science companies. She also directed NIH HEAL Initiative programs for joint and back pain. Criswell will continue to lead her lab within the National Human Genome Research Institute. Prior to joining NIH in 2021, Criswell served as vice chancellor for research at the University of California, San Francisco (UCSF) as well as professor of rheumatology in the UCSF Department of Medicine and professor of orofacial sciences in its School of Dentistry. NIAMS Deputy Director Anna E. Mazzucco, PhD, will serve as the institute's acting director.

Global AI prize awarded to Biomni-AD & Prima Mente

The Alzheimer's Disease Data Initiative selected two teams—Biomni-AD (a collaboration of Stanford University and Icahn School of Medicine at Mount Sinai scientists led by Kuan-lin Huang, PhD, pictured here) and Prima Mente (an AI biology company based in San Francisco, London, and Dubai)—as co-winners of its 2026 Alzheimer's Disease Insights AI Prize. Biomni-AD's winning agentic AI solution acts as a co-scientist for Alzheimer's research and performs normally time-consuming research tasks in minutes with a higher level of accuracy than general AI models. Prima Mente's winning modelling and discovery platform, PARTHENON, acts as a virtual "wet lab," enabling researchers to model experiments using virtual cells plus the support of Athena, an AI co-scientist. This year the competition, originally a solo award of $1 million, expanded to name two winners and double the total prize remuneration to $2 million due to the exceptional quality of submissions and the urgent need for innovation in the field. Importantly, the AI tools of both winning teams will be made freely available to all researchers world-wide through AD Workbench, a flagship data sharing and analytics platform for Alzheimer's research.



CUGH 2026 names its Global Health awardees

In March, the Consortium of Universities for Global Health announced its 2026 global health awardees, recognized for their accomplishments demonstrating "exceptional commitment, innovation, and impact in global health."

CUGH honors Murphy and Smith with Distinguished Leadership awards

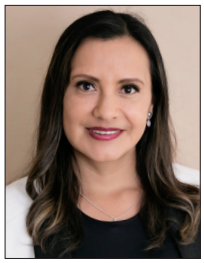
Robert Murphy, MD, a Fogarty advisory board member and professor of medicine and biomedical engineering at Northwestern University, has received a CUGH 2026 Distinguished Leadership in Global Health Award. His research includes development of new antiretroviral drugs and vaccines for HIV and viral hepatitis as well as the scale-up of therapy and point-of-care diagnostics for HIV/AIDS, tuberculosis, cancers, and emerging infectious diseases

in sub-Saharan Africa. He is principal investigator for several Fogarty International Center research training grants and the Center for Innovation in Point-of-Care Technologies for HIV/AIDS and Emerging Infectious Diseases at Northwestern University, which is one of the six centers that comprise the NIH's Point-of-Care Technology Research Network. He is also a member of the National Institute of Biomedical Imaging and Bioengineering's Rapid Acceleration for Diagnostics (RADx) Tech III High Performance Steering Panel and RADx HIV Viral Load Panel. Murphy is a member of multiple medical societies, including the Infectious Disease Society of America, and he sits on the boards of several non-profit organizations. Murphy has published more than 350 scientific papers and launched the *Biomedical Engineering for Africa* textbook, which will publish its second edition in 2026.

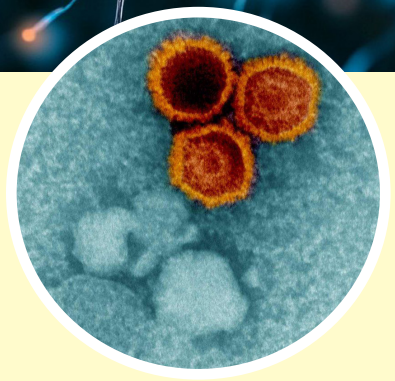
Woutrina Smith, DVM, PhD, an agronomist and executive director of the One Health Institute at University of California, Davis (UC Davis), also has received a CUGH 2026 Distinguished Leadership in Global Health Award. She is the associate dean for Global Programs at the School of Veterinary Medicine and a Professor of Infectious Disease Epidemiology at University of California, Davis. Smith previously served as director of the USAID One Health Workforce-Next Generation Project while simultaneously working as co-director of the Planetary Health Center of Expertise for the University of California Global Health Institute. She is recognized for her research spanning One Health, molecular epidemiology, and infectious diseases and has received funding from the U.S. Agency for International Development, the U.S. Department of Defense, and the Bill & Melinda Gates Foundation, among others. Additionally, she has mentored numerous trainees and teaches in UC Davis' professional and graduate degree programs. Smith, who received her DVM, MPVM, and PhD from UC Davis, has published more than 100 scientific papers.

CUGH honors Ngaruiya and Blas with Mid-Career Leadership awards

Christine Ngaruiya, MD, DTM&H, director of the Stanford Emergency Medicine International Global and Population Health Section, is a recipient of CUGH 2026's Dr. Thomas Hall-Dr. Nelson Sewankambo Mid-Career Leadership Award. Ngaruiya is currently an Associate Professor in the Stanford Department of Emergency Medicine and previously an Assistant Professor in the Department of Emergency Medicine at Yale University. Her research interests include noncommunicable diseases and community-based interventions with a particular focus on Africa and her research projects have been funded by the National Institute on Drug Abuse and the National Heart, Lung, and Blood Institute. She has served on multiple NIH panels related to noncommunicable disease topics and is a founding member of the Yale Network for Global Noncommunicable Disease. Most recently, she assisted Kenya's Ministry of Health through her leadership of a national cross-sectional study assessing burden and risk factors for NCDs. She graduated from University of Nebraska College of Medicine and London School of Hygiene and Tropical Medicine.



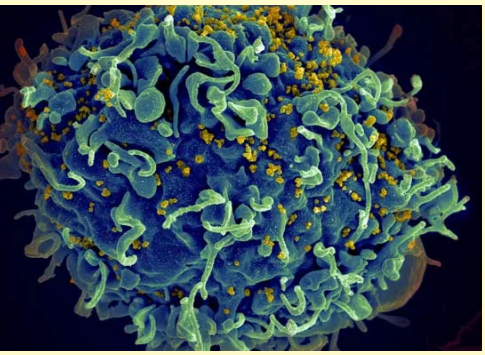
Magaly Blas, MD, PhD, a former Fogarty fellow and director of Mamás del Río, Peru, is also a recipient of CUGH 2026's Dr. Thomas Hall-Dr. Nelson Sewankambo Mid-Career Leadership Award. Blas is an associate professor at Universidad Peruana Cayetano Heredia (UPCH), Peru, and an affiliate associate professor in the Department of Global Health at the University of Washington, United States. She earned a master's degree in public health and a doctorate in epidemiology at the University of Washington following completion of her medical degree at UPCH. Her research interests include maternal and child health, HIV prevention, and the epidemiology of HIV, HPV, HTLV, and other sexually transmitted infections. Mamás del Río is an initiative aiming to improve the health of mothers and newborns in rural and remote areas of the Peruvian and Colombian Amazon through the training of community health workers empowered with technology. In 2019, Blas received the Award for Social Innovation in Health from the Pan-American Health Organization. Previously the OWSD-Elsevier Foundation Awards for Early-Career Women Scientists in the Developing World recognized Blas for her work in public health. She also has received the L'Oréal-UNESCO Concytec Award, which recognizes Peruvian scientists for their impact on research.



Global HEALTH Briefs

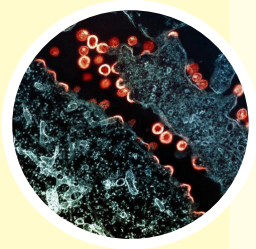
NINDS and SymBio continue joint research of Epstein-Barr associated MS

Recent studies have shown a strong association between infection with Epstein-Barr virus and onset of multiple sclerosis, a chronic disease that causes a breakdown of the protective covering of nerves leading to numbness, weakness, trouble walking, and vision changes. The National Institute of Neurological Disorders and Stroke (NINDS) and SymBio Pharmaceuticals Limited recently announced a three-year extension of their Cooperative Research and Development Agreement. SymBio's novel treatment for Epstein-Barr virus-associated multiple sclerosis targets the Epstein-Barr virus and markedly suppresses its activity. Results from studies of the new treatment in marmosets have prepared the way for evaluating its safety and efficacy in humans, according to the company. SymBio, a drug company headquartered in Tokyo, Japan, with subsidiaries in the United States, published its results in the *Journal of Clinical Investigation.*



70% reduction of new HIV cases seen in new NIH-funded study

Healthcare systems often struggle to reach and retain people who need HIV prevention and care. A new strategy tested in Africa could become a model for reducing HIV incidence worldwide. Rural communities in Kenya and Uganda saw a substantial reduction in new HIV cases by practicing a new intervention, say University of California, San Francisco, researchers who presented their findings at the 33rd Conference on Retro-viruses and Opportunistic Infections. The researchers paired 8 rural communities in Kenya with 8 Ugandan communities with similar characteristics, then they randomly assigned one community in each pair to receive the new intervention, while the other received the standard of care (visiting the local clinic for consultation and treatment as usual). The new intervention had three components: home visits for HIV testing and referrals, personalized HIV prevention and care, and a new app linking the visiting community health workers and clinics to enable home delivery of drugs and follow-up care. All individuals were tested for possible changes in their HIV status. Two years after the study began, seven of about 42,000 people in the intervention communities and 22 of about 42,000 people in the standard treatment communities had acquired HIV. The NIH's National Institute of Allergy and Infectious Diseases, National Heart, Lung, and Blood Institute, National Institute of Mental Health, and National Institute on Alcohol Abuse and Alcoholism helped fund this research. An estimated 30,000 people in the United States become infected with HIV each year.



Investigators aim for a simple blood test to detect gallbladder cancer

Because it often grows without symptoms, gallbladder cancer is usually detected late and prognosis for patients is poor. Researchers at Tezpur University in Assam, India, and the University of Illinois Urbana-Champaign have identified chemical signatures of gallbladder cancer in blood, raising the possibility of developing non-invasive tests for diagnosis. The study team analyzed blood samples from three different groups of people: gallbladder cancer patients without gallstones; cancer patients with gallstones; and individuals with gallstones, but no cancer. The researchers detected hundreds of altered metabolites and identified distinct markers in the blood related to each of the three groups. The study highlights the value of international collaborations enabling research where incidence is highest. Incidence of gallbladder cancer varies widely; it is relatively rare in the United States (12,640 new diagnoses of cancer of the gallbladder and nearby large bile ducts are estimated for 2026), yet it is among the most common cancers in northern India's Assam state. Larger, multicenter studies are still needed to verify these results, say the researchers who published their findings in the *Journal of Proteome Research.*

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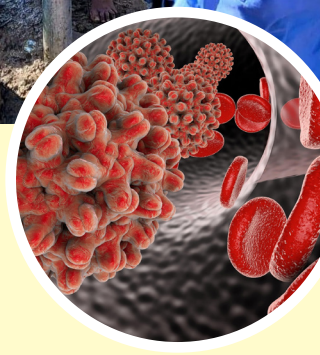

Could this model keep clean water flowing in Africa?

New research from the University of Notre Dame has helped nongovernmental organizations in Ethiopia, Malawi and the Central African Republic provide more consistent access to clean water for more than a million people. In rural sub-Saharan Africa, roughly 184 million people rely on shared handpumps for clean water, yet too often these pumps break, preventing water flow until they're fixed. The researchers examined data on mechanic visits and water-point functionality from three countries that use very different approaches to water handpump maintenance. Next, they developed a dynamic optimization model, based on the Markov Decision Process, that identified optimal schedules for mechanics to visit and conduct maintenance and repair services. Well-timed preventive maintenance not only substantially reduces downtime but frequently lowers logistical costs, the researchers note. Their paper, published in the journal *Manufacturing & Service Operations Management,* won an award from the Institute for Operations Research and the Management Sciences, an international applied science society.

NIH funds an international group pursuing hepatitis B cure

A five-year, multi-million-dollar award from the National Institute of Allergy and Infectious Diseases established a multinational Hepatitis B and HIV Cure Consortium led by Johns Hopkins Medicine. Hepatitis B is a vaccine preventable yet currently incurable viral infection that can cause chronic disease, which may lead to cirrhosis or liver cancer. About 300 million people worldwide are already infected with hepatitis B virus, while another million people acquire a new infection each year. The consortium is composed of research groups in Brazil, India, Senegal, Uganda, and the United States. In its first year it aims to enroll a multinational group of participants, some with both HIV and chronic hepatitis B and others with just chronic hepatitis B, to serve as a source for blood, liver tissue, and other specimens used in the consortium's studies.

TB transmission rates among schoolkids plunge with screening & prevention

Existing tuberculosis (TB) screening, treatment and follow-up protocols can significantly reduce TB transmission and TB burden among refugee schoolchildren in high-prevalence areas of India, researchers find. (*Burden* refers to the total impact of health problems—death, morbidity, and disability—on a population.) The researchers conducted a prospective analysis, following the subjects of their study beginning in 2017, when the Johns Hopkins Medicine-led Zero TB in Kids program was first implemented in northern Indian schools, monasteries, and nunneries where Tibetan refugee schoolchildren congregate. Over the eight-year period, screening combined with TB preventive treatment led to an 83% reduction in TB incidence. After a single round of screening and TB preventive treatment, the occurrence of new TB infections declined by 59%. The Johns Hopkins team worked with colleagues from the University of Wisconsin-Madison and Indian government agencies. Their study, funded in part by the National Institute of Allergy and Infectious Diseases, appears in *The Lancet Regional Health – Southeast Asia.*

Researchers develop new vaccine to prevent chikungunya

Researchers at Griffith University, Australia, and Washington University School of Medicine, United States, are working on a new vaccine to prevent chikungunya. Chikungunya virus, transmitted by infected mosquitos, has been reported in more than 100 countries in Africa, Asia, Europe, and the Americas, including the United States. The virus enters the bloodstream and begins affecting the immune system, joints, muscles, and sometimes the nervous system. Chikungunya can cause direct tissue damage, intense inflammation, and even immune-mediated attacks, with the immune system continuing to attack joint tissues even after the virus has left the body. Up to 60% of patients experience joint pain for months or years. A paper published in *Biomaterials* describes how the researchers created a mimic of the part of the virus that triggers the immune response by engineering *E.coli* to assemble biopolymer particles displaying chikungunya antigens. Tested in mice, the immune system recognized the engineered particles, a type of subunit vaccine, as a virus and mounted a response. The next stage of this vaccine's development involves safety testing in humans.

FUNDINGNEWS

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TO READ MORE

On behalf of the Fogarty International Center at the U.S. National Institutes of Health (NIH), the following funding opportunities, notices, and announcements may be of interest to those working in the field of global health research.

Funding Announcement	Deadline	Details
Global Infectious Disease Research (GID) Training Program (D43 Clinical Trial Optional)	August 6, 2026	https://www.fic.nih.gov/Programs/Pages/infectious-disease.aspx
Emerging Global Leader Award (K43 Independent Clinical Trial Required) (PAR-24-295)	December 3, 2026	https://grants.nih.gov/grants/guide/pa-files/PAR-24-295.html
Emerging Global Leader Award (K43 Independent Clinical Trial Not Allowed) (PAR-24-296)	December 3, 2026	https://grants.nih.gov/grants/guide/pa-files/PAR-24-296.html

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