UCSF Global Health Sciences

2015 Annual Report

Letter from the Executive Director

Dear Friends,

As I reflect on 2015 at UCSF Global Health Sciences, I am both proud and energized by our accomplishments. Haile Debas's vision 13 years ago has developed into one of the largest academic global health sciences programs in the US. With a budget of $60 million and nearly 300 faculty and staff, we are conducting rigorous scientific research, providing leadership and technical assistance, and educating the next generation of global health leaders in order to reduce the burden of disease around the world.

The field of global health sciences is by its nature collaborative, and that collaboration is key to our ability to make an impact in the global health arena. Clinicians, ministries of health, other governmental entities, and international aid organizations play key roles in our work and our success. Basic scientists, epidemiologists, economists, and other social scientists are essential to the rigorous research we conduct. So the move to UCSF's Mission Bay campus a year ago is important because it has fostered collaboration with colleagues across UCSF in a way that was not possible when our faculty and staff were not present on a UCSF campus.

One very tangible result of our move is the development of a large and vibrant new faculty affiliate program. More than 250 faculty across UCSF, all with research interests in global health, have joined the program. The program provides resources, organizes events, and fosters a community of collaboration among global health professionals across the UCSF campus.

Dedicated, knowledgeable leadership has been fundamental to our success as well. We are fortunate to have an incredible team of experienced and emerging global health leaders working together at GHS. The depth and breadth of knowledge and experience that they bring to our work in areas such as HIV/AIDS, malaria, global surgery, maternal and child health, policy, and systems continue to lead to stunning successes in improving the health of people worldwide.

I want to call particular attention to Eric Goosby, MD, who directs our global health delivery and diplomacy efforts. In 2015, UN Secretary General Ban Ki-moon named him to the new position of UN Special Envoy on Tuberculosis. In that role, he works with international leaders to encourage countries with TB to strengthen their response to this curable disease.

Dr. Goosby is just one example of the leadership and expertise our people provide to governments, ministries of health, and organizations such as the United Nations, World Health Organization, and the Centers for Disease Control.

I'm proud of the role we're playing in the global health sciences field, and though there is still much to be done to reduce the burden of disease and to achieve health equity across the globe, I'm optimistic. I need only hear our students' passion for global health work or see the results of the work of our faculty and staff to know that together we will continue to advance health worldwide.

This annual report takes a look at a few of the projects and people that are making a difference around the world. Our impact is far reaching, both in terms of geography and the range of global health issues we're addressing. The contributions of our faculty and staff, our partners here at UCSF and around the world, and our funders make our work possible. I am grateful to all of you.

Best regards,

Jaime Sepulveda, MD, MPH, DrSc
Executive Director
Haile T. Debas Distinguished Professor

Educating future leaders

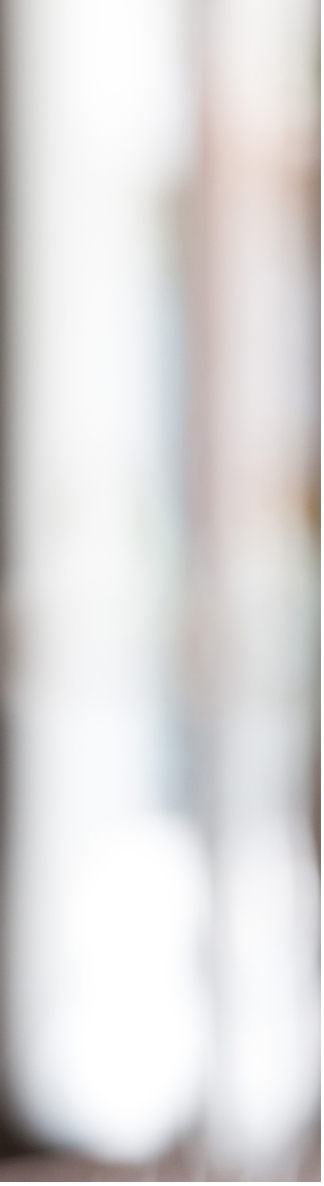
Training the next generation of global health leaders is central to our mission. In 2015, we expanded that mission with the addition of a new PhD program. Together with our master's program, the first in the nation, the doctoral program plays a key role in developing leaders who will continue to shape our nascent field and transform global health in the years ahead.

The PhD program prepares graduates for careers in research, policy, organizational leadership, and academia by teaching them to apply transdisciplinary knowledge from public health, epidemiology and biostatistics, public policy, economics, clinical and basic sciences, and much more to address global health problems.

After receiving approval from the UCSF Academic Senate and the UC Office of the President, the program opened for application last fall with a January 2016 start date. Even with a very short application period, we had an excellent applicant pool and admitted five accomplished students, all of whom already had impressive experience in global health sciences working as researchers, clinicians, academics, and management specialists.

Meanwhile, the master's program continues to thrive, graduating 41 candidates last July—our largest class to date. Like those who came before them, these students are remarkable. In the spring prior to graduation, each student completed a capstone project—the centerpiece of the program—a nine-week opportunity to conduct original research and explore an interest area in depth. Our students traveled to four continents to research topics ranging from HIV and preterm birth to the role of microfinancing in health and the characteristics of patients in motorcycle accidents in Tanzania.

These new graduates are now ready to bring their leadership skills, knowledge of rigorous research methods, and passion for global health to reducing the burden of disease around the world.



Spotlight: Deeqa Mohamed, master's student

Deeqa Mohamed was born and raised in the East Bay, but her passion for global health is rooted in her ancestral home, Somalia.

She's inspired by Edna Adna, Somaliland's former first lady and foreign minister. Adna is perhaps best known as the individual powerhouse behind the nation's recent campaign against female genital mutilation (FGM) and other traditional harmful practices.

Growing up, Mohamed spent time in Hargeisa, where Adna opened the country's first maternity hospital, with nurse-midwives who go out into the community as health educators.

"They opened my eyes to the devastation caused by FGM and the strong cultural preferences to use traditional birth attendants for delivery," she said. "The more I learned, the more certain I felt about pursuing a career in global health, because for the first time I had witnessed the power of a single individual and how, through her own sheer will, she could spark a national movement for change within one generation."

Mohamed brought this passion for health education back to the Bay Area, where she worked as a peer health counselor and mentor while an undergraduate at the University of San Francisco. There Mohamed met an alumnus of the GHS master's program who gave her insight into how a GHS master's degree could help her reach her goal of educating adolescents and young women about sexual and reproductive health.

Her next step toward that goal is completing a capstone project with her mentor, GHS researcher Nadia Diamond-Smith, PhD. For her capstone, Mohamed will travel to Nairobi, Kenya, to conduct qualitative interviews with adolescents and young women on their perceptions and experiences of post-abortion care.

By and large, abortion is illegal and remains highly stigmatized in Kenya. As a result, many women obtain illegal and unsafe abortions and often experience post-abortion complications such as hemorrhage and infection. They then visit a clinic for post-abortion care, which is legal.

Mohamed's research seeks to characterize how women are being treated and what their perceptions are about the quality of the care. She and Diamond-Smith plan to use her research to develop interventions that improve post-abortion care delivery and reduce the stigma of abortion so that more women will feel empowered to seek post-abortion care.

Eliminating malaria in Swaziland

The news regarding the elimination of malaria was extremely positive in 2015. A World Health Organization/UNICEF report concluded that the Millennial Development Goal target for malaria—to have halted and begun to reverse incidence of malaria—had been achieved convincingly, with a 37 percent drop in malaria cases and a 60 percent decline in deaths over the past 15 years.

One example of that success is Swaziland, which is poised to eliminate malaria by the end of 2016, according to the country's National Malaria Control Programme (NMCP). If the country achieves malaria elimination, it will be the first country in southern Africa to achieve zero local cases.

While Swaziland's strong surveillance and response system and program management accounts for much of its success, the Malaria Elimination Initiative (MEI), a project of our Global Health Group under the direction of Sir Richard Feachem, has played a key supporting role.

As a long-time partner of Swaziland's NMCP, MEI has been involved in Swaziland since 2008, providing technical assistance to help the country shift from malaria control to malaria elimination, and in 2011 helped develop a successful proposal to the Global Fund to mount a campaign to wipe out malaria.

MEI has collaborated on research to improve the country's active case detection program and is now conducting research that will help determine malaria programming as the country reaches for the national elimination goal.

In addition, MEI's development of user-friendly, real-time disease risk maps enables health workers to better target malaria interventions. In partnership with Google Earth Engine, the MEI is also developing an automated risk-mapping platform capable of using individual case or health facility data. Preliminary results show that the risk maps have extremely good predictive accuracy, identifying the areas of the country in which malaria cases are most likely to arise and which therefore require targeted interventions.

While Swaziland's elimination program is robust, Feachem warns that cross-border measures need to be strengthened. "For many eliminating countries, including Swaziland, close collaboration with neighboring countries is key to success," said Feachem.

Indeed, Swaziland's leaders recognize that it will not be able to achieve malaria elimination alone, and so will also rely on its neighbors to drive malaria down. In this effort, Swaziland has played a leading role in the Elimination 8 (E8), a regional initiative that also includes Angola, Botswana, Mozambique Namibia, South Africa, Zambia, and Zimbabwe. The E8 provides a platform for joint planning and negotiation towards strategies that mutually reinforce countries' individual and shared elimination efforts. Regional initiatives, in addition to new tools, will accelerate elimination efforts in countries, like Swaziland, that are paving the way for global eradication of malaria.

Spotlight: Sean Parker, philanthropist

When philanthropist Sean Parker, the founder of Napster and former president of Facebook, launched the Parker Foundation, he set a single guiding principle: support a complete solution. "I try to only focus on the problems where I have some insight or a set of relationships or capabilities where I can actually do something about it and see a path to zero," he told the *Chronicle of Philanthropy*.

After Parker spent time in Africa and observed that the response to vector-borne diseases in low-income settings was vastly different than in wealthy nations like the United States, he turned to GHS's Malaria Elimination Initiative (MEI), a program of the Global Health Group under the direction of Sir Richard Feachem, to provide the complete solution. "Malaria was successfully eliminated in the western world, and we know that eradication is possible. While incredible strides have been made in combating the disease, we must be relentless to reach the ultimate goal: a world where humanity no longer has to endure the suffering inflicted by this disease," Parker said.

Parker's $4.5 million gift is enabling MEI to conduct research on control of the *Anopheles* mosquito, which transmits malaria, to understand the full landscape of possibilities for eradicating malaria: past, present, and future tools; how innovative tools are being used; and the possible impacts on malaria transmission when various combinations of interventions are implemented. The goal is to build evidence around an array of innovative tools and approaches tailored to local ecologies that have the potential to drastically reduce malaria transmission.

"Sean Parker's generous and enthusiastic support, along with the help of our many partners worldwide, allows us to explore radical new approaches to control the *Anopheles* mosquito," said Feachem. "With this gift we are able to accelerate solutions towards achieving a malaria-free world."

"I'm confident that under the leadership of Sir Richard, this research effort will explore underutilized tools and transform the approaches we use to finally eradicate malaria," Parker said.

Using data and technology to improve health

A data tool developed by the Informatics Hub @ Global Health Sciences is making a difference in reducing transmission of HIV from mother to child and improving health system resilience in Uganda and other locations in Africa.

The dashboard and related phone app, which display in realtime aggregate data related to preventing the transmission of HIV from mother to child, revealed that a large number of healthcare facilities did not have a stock of the HIV test kits used during a pregnant woman's first visit to a health facility. Without the kits, women were not being tested; those who were HIV positive were not getting the drugs needed to stop transmission of HIV to the child.

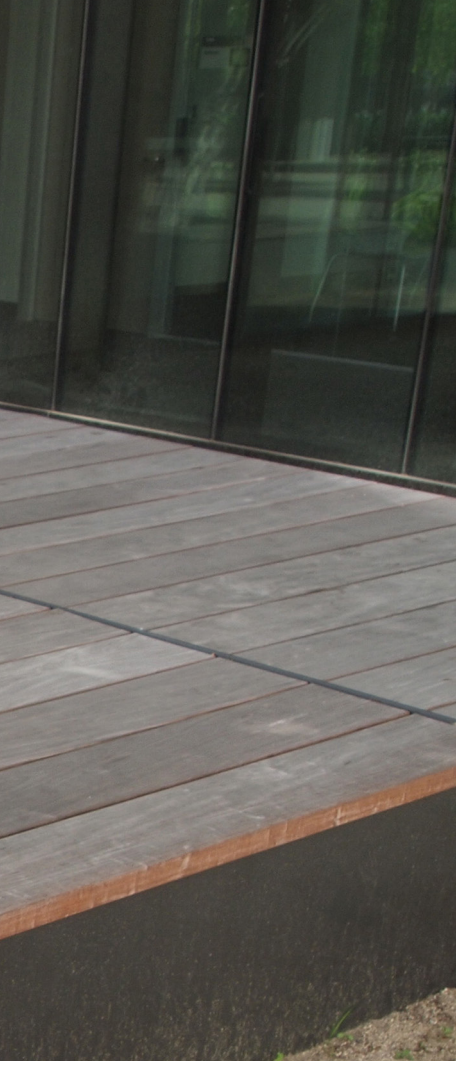
With the dashboard information, the Uganda Ministry of Health was able to bring together the various stakeholders to respond to the issue and reduce the number of facilities without test kits from 250 to around 30. Once that problem was solved, the Ministry could focus on monitoring whether women who tested positive were getting the antiretroviral drugs they needed. The measurable result is a reduction in the number of babies who contract HIV either during birth or through breastfeeding.

This type of data and the low-cost technology to collect, store, analyze, and transform it into useful information have become important tools for ministries of health and other healthcare organizations to make decisions, monitor diseases and other conditions, and improve healthcare delivery.

The Global Strategic Information (GSI) group at GHS, under George Rutherford's direction, is at the forefront of developing these technology tools and is working with governments to create the strategies for using them. GSI, with support from others in GHS, established the Informatics Hub @ Global Health Sciences—a group of researchers at UCSF and African health informatics professionals with expertise in database and website development, health information data systems, app development, and geographical information system mapping.

In addition to the dashboard for Uganda's Ministry of Health, which was developed in partnership with Makerere University, their work includes:

- Setting up a system in Namibia to collect aggregate data about the number of malaria patients, number of pregnant women getting prenatal visits, and other treatment information
- Building a dashboard and database for the National Institute for Health in Mozambique that collects lab data about diseases such as measles and cholera to get a better idea of disease outbreaks in the country and mobilize appropriate responses



- Supporting I-TECH and the Ministry of Health in Botswana to develop a national reporting system to improve the overall quality of services, such as HIV care and treatment, mother-to-child transmission of HIV, and tuberculosis treatment. This work is based on the success story in Uganda.

While the Informatics Hub has focused on developing low-cost data tools to monitor and evaluate HIV/AIDS patients, they also partner with local governments and health centers to develop strategies to ensure the tools are tailored to local needs.

They believe their products can be easily adapted to other health conditions, and are now collaborating with GHS colleagues working on malaria elimination, mother and newborn child health, and other global health issues.

Spotlight: Fitti Weissglas, senior manager, Global Health Informatics

When Fitti Weissglas was studying software engineering in his native country, the Netherlands, he never planned to work in global health or live in the US. Yet, here he is: the senior manager and technical lead of the Informatics Hub @ Global Health Sciences.

Informatics is the science of collecting, storing, analyzing, and transforming data into information that can be used to help people make better decisions.

Weissglas leads a team of software engineers from Uganda, Namibia, Mozambique, Tanzania, and Kenya who develop technology-based products that help ministries of health and other public health officials collect and analyze date in order to make better decisions.

Weissglas' journey from the Netherlands to San Francisco began when he met a group of Ugandans visiting his country to raise money to build a vocational school. He became curious about the country and the people, so he traveled to Uganda for a holiday. "I fell in love with the country and the people and decided to find a job there," he said.

In 2004, he went to work for the Centers for Disease Control (CDC) in Uganda, developing software. During that time, he added a master's in epidemiology so that he might better understand the types of data the CDC wanted to collect and analyze.

Then, in 2011, he joined the Global Strategic Information group at GHS where he and GHS colleagues Hilary Spindler and Hugh Sturrock have created the Informatics Hub @ Global Health Sciences. The group builds databases, apps for mobile phones, dashboards, health information systems such as electronic medical records, and more.

Recently Weissglas moved to San Francisco so that he could be closer to the Bay Area's technology innovators. He has already begun to meet and work with tech leaders.

"My job is fun and incredibly diverse," Weissglas said. "When you can use data to drive the agenda to improve people's lives, data becomes a means to get something done."

Saving mothers and babies

In 2015, GHS expanded its research expertise in the area of maternal and newborn child health, with a focus on improving facility-based birth outcomes. Despite policy changes to increase the use of hospitals and other healthcare facilities for childbirth in low-income countries, mortality and morbidity rates remain high. Recent estimates indicate roughly 290,000 women and almost 1 million babies die during the first 24 hours after birth globally every year.

To address this issue, GHS has created a new unit focused on improving care provided at hospitals and health clinics. Care during the brief and critical period of labor and delivery, in particular, can have significant positive impact for both mother and child.

Dominic Montagu's and May Sudhinaraset's research in India and Kenya aims to identify and understand the reasons that keep women from using hospital-based care. They are also applying quality improvement methods refined in the US and Europe to develop, test, and replicate interventions to improve the delivery experience so that more women will seek facility-based care.

Dilys Walker and her team focus on birth-simulation training for healthcare providers, with a focus on the team rather than the individual provider. Their research shows that by practicing various labor and delivery scenarios, such as how to manage pre-eclampsia and how to resuscitate an asphyxiated infant, the healthcare team gains knowledge and confidence and learns to work together and communicate more effectively. Those skills carry over and improve care during actual childbirth.

Walker's team is currently working on projects in Guatemala, Kenya, India, and Uganda using the PRONTO training method (see page 11) and low-tech birth simulator she developed. The Bihar, India, project scales up the PRONTO training method, using mentors and new evaluation tools to measure the effectiveness of the training. While research is underway to measure the effectiveness of this birth-simulation training, an earlier trial in Mexico showed a 40 percent relative reduction in early neonatal deaths.

Walker also leads the Preterm Birth Initiative–East Africa in Kenya, Uganda, and Rwanda. This work incorporates the PRONTO approach in Kenya and Uganda, with the addition of data strengthening, implementation of a modified Safe Childbirth Checklist, and locally driven Quality Improvement cycles.

Spotlight: Dilys Walker, director, Maternal and Newborn Child Health

Dr. Dilys Walker's goal is to save mothers' and babies' lives by improving the care given by provider teams at birth.

"The time around childbirth has enormous risk because providers can't predict when things will go wrong, so they need to always be ready," Walker said. "This is a great window of opportunity to improve care and uncover errors waiting to happen."

Walker, a professor of obstetrics and gynecology, believes that if healthcare teams practice dealing with complications during childbirth, they are better equipped to handle those complications when they actually occur. So, she and her colleague Susannah Cohen developed a method of birth simulation training using low-tech tools and a curriculum they created. A key tool is PartoPants™—basically recycled hospital scrubs designed for birthing a doll and with a pouch for fake blood to simulate hemorrhage. During the training, an "actor" dons the PartoPants and plays the role of the birthing mother. The scenario is videotaped for review during the debrief. The key is that providers feel like the emergency is real and respond accordingly with the resources they have at hand.

Two things distinguish Walker's work: she focuses on the mother-child dyad, while many programs focus on only the mother or only the child. And, she acknowledges and respects the cultural issues and conditions in each location. For example, many women in Guatemala rely on traditional birth attendants in the community for pregnancy and childbirth, so Walker trains professional healthcare providers to work with the attendants and to include them in the facility-based birth scenarios.

Walker became interested in this work during medical school. "I took a year off and did what, looking back, could be seen as 'medical tourism,' including some time in Kenya," she said. "There I met an older midwife who managed to do extraordinary things for the mothers and babies she cared for. I saw first-hand that the providers, as well as the mothers and babies, needed support."

She and Cohen developed the training program in 2009 when Walker was working in Mexico for the National Institute of Public Health. At the time, the maternal death rate was not responding to national efforts to decrease it. Most maternal deaths were occurring in healthcare facilities that had the necessary equipment and providers. One had to conclude that the teams were unable to respond effectively or optimally to the emergencies they faced. Coincidentally, The Mexican National Institute for Women (INMujeres) asked her if Walker had any ideas that she felt deserved funding.

Walker and Cohen created, almost overnight, the program that later became PRONTO. The National Institute for Women funded the initial pilot project in five hospitals and then gave additional funding to expand to a more rigorous trial in 24 hospitals. When Walker later moved to Seattle, they expanded the program to other countries including India, Kenya, and Guatemala. The Mexican team has rolled out the training in seven states, and continues to train locally.

Eventually, Walker and Cohen separated the training program from the research program, which develops and evaluates new models of training. The training program is now the not-for-profit organization PRONTO International. The research program designing implementation trials and evaluation is Walker's work at UCSF.

"We are committed to rigorous implementation and evaluation because we want to make sure what we are doing really works," Walker said. "That's where moving to UCSF Global Health Sciences has helped. Here I've found academic collaborators that help me strengthen what we do and push me to look at the work from different perspectives."

Finding a cure for HIV

The AIDS Research Institute (ARI) coordinates all the research, clinical care, and education on HIV/AIDS at UCSF and helps to promote UCSF's groundbreaking scientific leadership on HIV to the UCSF community, the National Institutes of Health, our global partners, and the world at large. With many UCSF scientists working on HIV research across the globe, the ARI and GHS are natural partners.

In 2015, the Foundation for AIDS Research (amfAR) awarded the ARI $20 million over five years to fund an ambitious effort called the amfAR Institute for HIV Cure Research. The Cure Institute operates with a singular goal: to find a functional cure for human immunodeficiency virus (HIV).

A functional cure means that individuals infected with HIV would no longer need lifelong antiretroviral drug treatment to hold the virus in check.

The Cure Institute supports the work of scientists at UCSF, the Gladstone Institute for Virology and Immunology, the Blood Systems Research Institute, and other academic partners who are at the forefront of the effort to cure HIV/AIDS, rather than simply treating it as a chronic disease. The team members, all experts in the field of HIV cure research, have a well-established record of working collaboratively, and the Cure Institute will enable them to work innovatively, pivoting their work to follow the most promising cure science.

"San Francisco and UCSF have remained steadfast in the commitment to confront the epidemic, and we are proud to have been chosen by amfAR as the only HIV cure institute in the nation," said Paul Volberding, MD, who is director of the new institute. Volberding also is director of the ARI, which will provide administrative management for the amfAR Institute, and is director of research at Global Health Sciences. "This will bring together a broad team of leading scientists who believe a cure is possible, and that it will happen here. We're ready to end this epidemic."

Leadership

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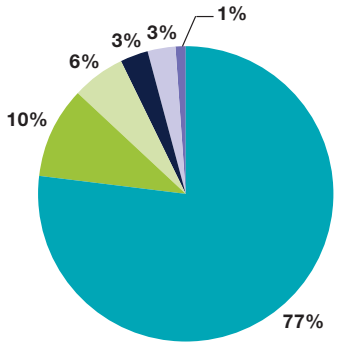
Financials

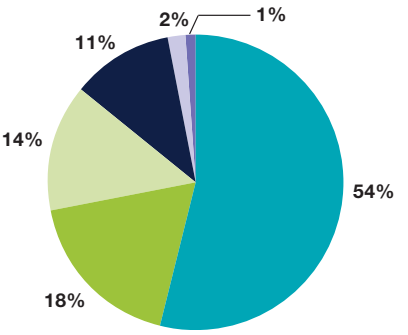
FUND SOURCES



Total: $62,104,143

- Sponsored projects
- Gift/endowment income
- Campus support
- Recharges
- Tuition and fees
- ICR recovery

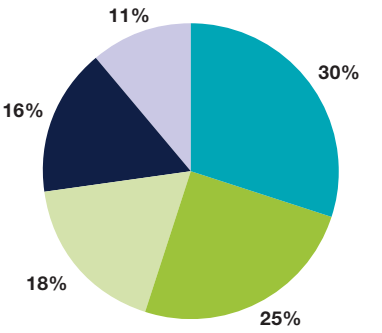
FUND USES



Total: $58,401,842

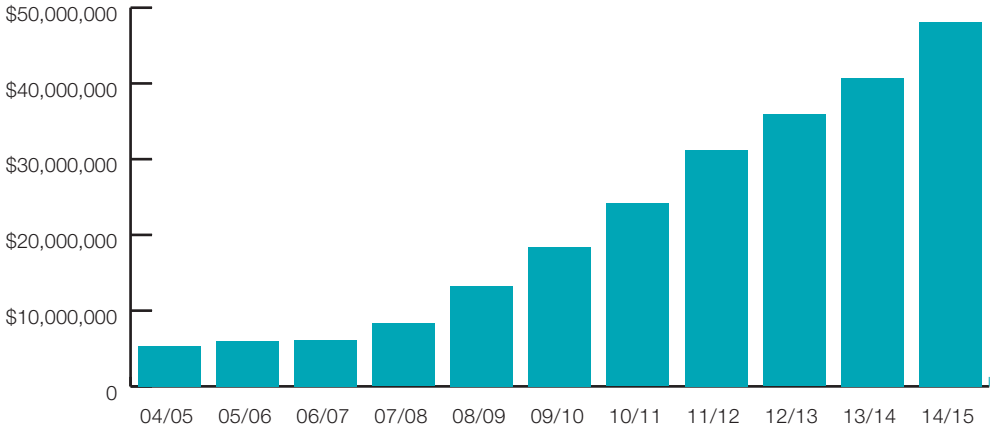
- Personnel costs
- Other non-payroll
- Subawards
- Facilities and administration
- Lease and rental
- Campus fees

MAJOR FUNDERS OF SPONSORED PROJECTS



- Bill & Melinda Gates Foundation
- Centers for Disease Control and Prevention (CDC)
- President's Emergency Plan for AIDS Relief—PEPFAR (CDC)
- Other
- National Institutes of Health

SPONSORED PROJECTS EXPENDITURES



Data on this page covers the fund year July 1, 2014–June 30, 2015. Totals include the AIDS Research Institute.

Donors

We are grateful to the individuals, families, and organizations that provided generous support to help us advance GHS and ARI research and programs in 2015.

INDIVIDUALS AND FAMILIES

$100,000–$500,000
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Gretchen C. and Howard H. Leach

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Listings are for for the 2015 calendar year.
In *Individuals and Families* only GHS donors are listed. GHS and ARI are both included in *Corporations & Foundations.*

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Photography
Front cover: Master's students Megan Moore and Poonam Patel by Elisabeth Fall; PRONTO medical provider training in Guatemala by James Rodríguez; Namibian girl by master's alumna Caitlin Moe '15
P4: Master's student Deeqa Mohamed by Susan Merrell
P5: Malaria surveillance in Swaziland by Michelle Hsiang
P6: Sean Parker, courtesy of Sean Parker Foundation
P8: Informatics Hub staff Felix Holl, MS '15 and Fitti Weissglas by Kerstin Svendsen
P10: Dilys Walker, MD, with a patient in Guatemala by James Rodríquez
P12: Postdoctoral scholar Charline Bacchus-Souffan and staff research fellow Vanessa York by Elisabeth Fall
Back cover: Master's instructor Mohsen Malekinejad by Elisabeth Fall; PhD student Maricianah Onono by Elisabeth Fall; Master's program director Madhavi Dandu with students Trudy Nasmith and Simranpal Dhanju by Susan Merrell; Master's students Sheba Vincent and Nnaemeka Nwaka by Elisabeth Fall