



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

## PEPFAR's Birx urges sharper focus to halt HIV globally

By Cathy Kristiansen

To protect and extend the significant progress made against the HIV/AIDS epidemic globally, policymakers and funders must target specific high-risk populations, especially young women in sub-Saharan Africa, according to U.S. Global AIDS Coordinator, Dr. Deborah Birx, who oversees the President's Emergency Plan for AIDS Relief (PEPFAR).

"You can't talk about a sustained response when you have an ever-growing epidemic," said Birx, who is also Ambassador-at-large and Special Representative for Global Health Diplomacy. "HIV is not everywhere and our investment needs to track where the disease is."

Birx made her comments during an NIH lecture honoring Dr. Joseph J. Kinyoun, who founded the one-room lab in 1887 that has evolved into 27 Institutes and Centers now comprising the agency. The annual event is hosted by the National Institute of Allergy and Infectious Diseases.

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Photo by Emie Branson/NIH



To successfully vanquish HIV/AIDS globally requires urgent focus on high-risk populations, such as young women in sub-Saharan Africa, PEPFAR's Dr. Deborah Birx told NIH.

## New Fogarty programs build capacity, spur research

Fogarty has issued a call for applications for two new programs—the first will build scientific capacity in West African countries affected by Ebola and the second will spur research into chronic, noncommunicable diseases (NCDs) in developing countries.

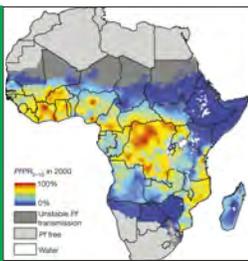
One-year planning grants will be awarded to U.S. or African research institutions to conceive research training focused on emerging viral epidemics for personnel at institutions in Liberia, Sierra Leone or Guinea. The application deadline is Feb. 24. The planning process is expected to lead to proposals for multiyear funding from one of Fogarty's established programs.

"We have seen the horrific results of the Ebola epidemic

in West Africa, where some countries lack the scientific capability to conduct disease surveillance and deploy resources to effectively treat their citizens and halt the spread of infections," said Fogarty Director Dr. Roger I. Glass. "Through these awards, we hope to develop sustainable research capacity to lessen the impact of future outbreaks."

To encourage research in NCDs and injuries occurring across the lifespan, Fogarty has requested applications for locally relevant and catalytic research on NCDs or injury in low- and middle-income countries. Pilot activities and research are expected to inform development of comprehensive programs that build sustainable research capacity and lead to diagnostics, prevention, treatment and implementation strategies. Applications are due Feb. 24.

## FOCUS



### Global Burden of Disease (GBD) project: new insights and directions

- Shifting disease burden presents challenges for health systems
- Issues such as salt consumption and blood pressure levels spur debate
- New geospatial mapping tools are in the works

Read more on pages 8 – 9

# PEPFAR's Birx urges sharper focus to halt HIV globally . . . continued from p. 1

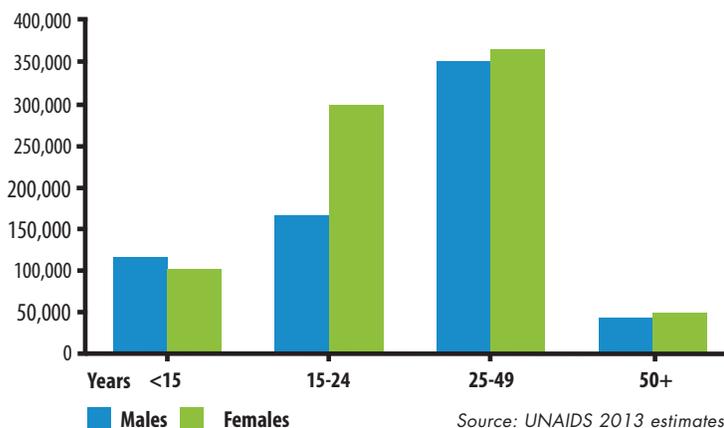
Urgent measures must be taken or there will be 28 million more people infected with HIV by 2030, according to a recent UNAIDS forecast, Birx warned. “We don’t have a choice; we risk losing our \$65 billion investment if we don’t figure out how to control infections.”

PEPFAR, with a \$6.8 billion annual budget covering 31 countries, has played a key role in controlling HIV since 2003. But with stagnant funding, more efficient use of resources is required, Birx said. “Funding has plateaued and the real challenge is how do we apply the tools that have been given to us through the scientific method and how do we do that in a budget-neutral environment.” It’s important, she suggested, to focus on the “right things, right places, right now.”

This means urgently directing resources to areas with the highest burden and scaling up interventions in a strategic and targeted way, along with collecting data to evaluate if efforts are working as intended, she said. “We’re spending our time focusing, focusing, focusing on the results we’re expecting to achieve and ensuring that all of our results predict those outcomes and are in alignment.”

Nearly three-quarters of existing and new HIV infections are in sub-Saharan Africa, Birx noted. With this in mind, PEPFAR’s 2017 targets in Africa include extending antiretroviral therapy to nearly 13 million more men, women and children, encouraging 13 million more male medical circumcisions and slashing new HIV infections in young women by 40 percent—which Birx said is the minimum needed to prevent the epidemic from outstripping the resources available to contain it.

**New HIV infections in sub-Saharan Africa, 2013**



She discussed the particular problem posed by new infections in young women, whose incidence of HIV is persistently high. A key reason is the age group has expanded by an astounding 30-40 percent in this region of Africa since the HIV/AIDS epidemic began, due in part to

success at protecting children under five years, who are now reaching adulthood, she said. There are now 10 million girls and women, aged between 10 and 29 years, up from 7 million in 1985.

New infections are also fueled by a sense among uninfected women that they are not at risk, as well as cultural norms whereby younger women feel coerced—or are raped—by infected older men, become HIV-positive and in turn spread the virus to male peers.

To take on this population in force, a trio of funders in 2014 launched a program called DREAMS, or Determined, Resilient, Empowered, AIDS-free, Mentored and Safe women. The \$280 million initiative is funded by PEPFAR, the Bill & Melinda Gates Foundation and the Nike Foundation. Related efforts aim to strengthen families, extend the years girls remain in school, provide youth-friendly sexual and reproductive health care, and mobilize communities to help change behavioral expectations.

Birx noted previous targeted interventions have had success against HIV, such as those aggressively treating infected pregnant women and their newborns with antiretroviral therapy. Health systems strengthening is also critical, she said.

Policymakers must remain vigilant for resurging HIV in populations where it is seemingly under control, she warned. For instance, Uganda, which had been a success until 2010, saw new infections soar to an historic high. Stakeholders set out “to analyze everything we were doing, because obviously it wasn’t working,” Birx recalls. They instituted new approaches, such as testing and immediately treating all pregnant and breastfeeding women no matter how low their HIV levels and encouraging male circumcision. “Uganda has gone from the highest burden of new infections to the potential to have control of the epidemic in less than five years,” Birx observed. “This is what we believe is possible if we bring the same approach” to other countries.

The NIH has played a leadership role in producing research to battle the HIV/AIDS epidemic and it is “enormously important” to continue moving basic science discoveries through the required rigorous steps to ultimately benefit human health, Birx said. No stranger to NIH, where she received training early in her career, Birx has collaborated with scientists on a number of HIV/AIDS clinical trials. These discoveries give her hope for the future, she concluded. “But now we need really a call to action to ensure that we move these policies into a new place so we can bring the end of AIDS, together, in the next five or 10 years.”

## RESOURCE

Lecture webcast: <http://bit.ly/BirxNIH>

# Testing curbs malaria drug misuse in Kenya

By Cathy Kristiansen

A Kenyan mother is worried that her lethargic, feverish toddler has malaria and rushes to the clinic. A diagnostic test might show the disease is absent, but neither the mother nor clinic wants to pay for it, so the child receives antimalarial medicine anyway.

Treating malaria where none exists can help the parasite build drug resistance. This has already occurred in Southeast Asia against the world's most potent antimalarial compound—artemisinin—and scientists predict resistance could soon strike Africa. Alarmed, Dr. Wendy Prudhomme O'Meara devised a study to discourage unwarranted use of malaria medicines in Kenya and recently described her work in the journal *BMC Medicine*. A former Fogarty staff scientist, she is now funded by NIH's National Institute of Allergy and Infectious Diseases and holds posts at both Duke and Kenya's Moi University.

"All of our frontline therapies include artemisinin," Prudhomme O'Meara said in a recent presentation to Fogarty. "The potential impact of artemisinin resistance is huge. We don't really have any other drugs in the pipeline, so if we lose this one, it's a serious problem."

In Kenya, artemisinin-based therapies are subsidized, to help everyone with malaria access effective treatment, but diagnostic tests are not covered. Government data show the population received 20 million artemisinin-containing treatments in 2009, compared with only 9 million confirmed malaria cases. Prudhomme O'Meara's study examined whether offering financial incentives to health care facilities would increase use of malaria diagnostic testing and curb prescriptions for patients with a negative finding.

She and her team enrolled 18 health care facilities that were evenly split between low- and high-malarial areas, with half as controls. They established seven performance indicators that counted toward the incentives, including records of patient identification numbers, quality lab diagnoses and clinician adherence to lab findings. The team held a workshop to refresh laboratory skills in microscopy—the primary diagnostic tool—and reread each sample result to monitor overall accuracy and further train technicians with false findings.

The one-year intervention covered nearly 15,000 patient encounters. Antimalarial prescriptions to those with a negative test result dropped substantially, from 22 to



Former Fogarty scientist Dr. Wendy Prudhomme O'Meara (right) and a Kenyan trainee set up a new microscope for malaria diagnoses to help curb unwarranted use of frontline drugs.

7 percent. Prescriptions to untested patients also fell dramatically, from 41 to 26 percent.

During the study, incentive payments averaged \$650 per quarter, about half the potential amount available. Facilities used the money primarily for equipment and supplies, including delivery beds, steam sterilizers and lab reagents, and also on building needs, such as security grills and plumbing repairs. "It took them a few quarters to get organized, then they really excelled," Prudhomme O'Meara explained. "The incentive also emphasized the teamwork involved in properly treating malaria, which includes record-keeping, pharmacy, lab and physician, all working together."

She said her team chose a facility incentive plan because previous efforts targeting individual health care providers in developing countries have produced little sustained change. If successful over the long run, this novel approach could not only protect the power of malaria drugs, but also re-channel some government funds previously spent on drugs into improving health infrastructure.

Although half of Kenyans obtain free malaria treatment in clinics, others buy their drugs directly from local stores. Recent retail price hikes for first-line malaria drugs made them more expensive than a diagnostic test, so the team devised a follow-up intervention targeting the informal health sector. The researchers are offering potential patients a voucher to pay for treatment based on a positive malaria diagnostic test result, which they hope will spur testing.

Successful programs could be expanded, Prudhomme O'Meara said. "We showed that these facility-directed incentives could be an important and potentially sustainable type of behavior-change intervention," she noted. "It is alarming that the uninfected patient is being treated with antimalarials, but even more concerning is for future patients for whom this drug is being compromised."

## RESOURCE

Paper: <http://bit.ly/Malaria-Test>

# PROFILE

## Fogarty Scholar studies kidney disease in Tanzania

By Cathy Kristiansen

During his Fogarty fellowship in Tanzania, internist and nephrologist-in-training Dr. John W. Stanifer came to regard global health research as very much a two-way flow of knowledge, with patients hearing about kidney health from him and he learning about their lives to help determine how best to treat their kidney diseases.

“Based on my own perceptions, I could say, oh, you shouldn’t go to traditional healers, those are bad,” Stanifer said. “But if you really want to make a difference, you need to take an interest in other people’s lives and learn about them and what they perceive the issues to be. If you both study each other, something valuable comes out of it.”

Stanifer practiced this approach during his year in Tanzania as part of Fogarty’s Global Health Program for Fellows and Scholars, which provides a yearlong mentored clinical research experience overseas for postdoctoral fellows and pre-doctoral scholars. The National Institute of Diabetes and Digestive and Kidney Diseases also supported his fellowship.

For his research project, Stanifer investigated chronic kidney disease (CKD) prevalence and causes in an area near Mount Kilimanjaro. The idea came from a reconnaissance trip before he applied for the fellowship. “These patients were coming into the clinic with advanced kidney disease or terrible acute kidney injuries and when you ask, ‘How common is it in the community, who has it, why are they getting it and what’s being done about it?’ the reply is, ‘We don’t know.’ So the research focus became describing the epidemiology of CKD in that region.” Worldwide, kidney conditions arise from noncommunicable and infectious diseases, environmental toxins and other triggers.

Stanifer and his team enrolled close to 500 adults in urban and rural areas, conducted a household survey and screened for CKD and other conditions—HIV, diabetes, hypertension and obesity. They documented lifestyle practices, such as alcohol, tobacco and traditional medicine use. More than 15 percent of urban adults had CKD, but only 2 percent did in rural areas. Surprisingly, about half the cases had no identifiable cause.



**John W. Stanifer, M.D., M.Sc.**

Fogarty Scholar:	2013 - 2014
Fellowship at:	Kilimanjaro Christian Medical Center
U.S. partner:	Duke University
Research topic:	Chronic kidney disease awareness, screening and prevention

Stanifer said to help him conduct research in a different culture, he took lessons in Swahili, a language common in northern Tanzania. “When they hear a *mzungu*, a white person, speaking their language, it’s an instant connection. They just laugh and laugh!” He also joined in local customs. “These elder women would be outside their huts drinking homemade alcohol at about 10 a.m. and I’d sit and drink with them. And cross my fingers on that one!” he recalls. “You’d do it for a day or two and finally they’d agree to be interviewed.”

He also learned to navigate logistical hurdles. When he arrived at the office one day, he discovered the toilet had overflowed and left a foot of water everywhere. “We had to put all of our supplies and research papers out on the grass in the sun to dry them out.”

Stanifer said he developed a wide range of research skills during his project—from study design and approval, to data collection and analysis, to manuscript writing and publication—priming him for an NIH career development award. “It was not a huge project, but it had a lot of moving parts. I feel like it’s given me an important leg up. I really served as principal investigator, learning what it takes to go from the beginning to the end of a clinical project.”

For now, mindful of how learning more about patients’ backgrounds can guide patient- and community-centered research, Stanifer is studying kidney disease in an underserved American Indian community in North Carolina. “This and the Tanzanian population are different in many ways, but there are a lot of similarities, too,” he said. “Finding a solution in Tanzania is going to be multifaceted, involve traditional healers, culture, sanitation, urbanization and infectious disease issues. For this American Indian population, it’s going to take those exact same things.”

## PETER CHERUTICH, M.B.CH.B., PH.D., M.P.H.

*Dr. Peter Cherutich is a deputy director of medical services in Kenya's Ministry of Health and heads its sexually transmitted disease control program. He has been active in HIV research for more than a decade. After earning his medical degree and master's in epidemiology at the University of Nairobi, he pursued a master's in public health (MPH) from the University of Washington (UW), supported by Fogarty. With additional funding from Fogarty and others, he earned a doctoral degree from UW, which honored him with its 2015 award for academic excellence.*



### What does this award mean to you?

It means a lot to me and also to other scholars from overseas, to show that it's possible with a lot of diligence to excel. I do hope it will inspire other people. I became conscious of public health as a child. I lived in a village where it was very common to witness complications of a lot of infectious diseases and I lost my younger sister to pneumonia that wasn't treated in time—the local health clinic didn't have the capacity.

### What role did Fogarty play in your career?

The enduring influence from Fogarty was through my MPH training and subsequent research, building my skills through research. It was transformative. The mentorship I got was very intense, from clarifying thought, to correction of typos and so on.

My focus was epidemiology with a minor in international health, and I took a lot of courses on epidemiological methods and biostatistics. The core training was very critical for me. I was beginning to launch my research career and this enabled me to conceptualize and design research proposals, to be able to do very robust analyses of my own data.

I learned the need for rigor, rigor, rigor. Research is not just like running a program. You need rigor and a lot of integrity. At the start of my MPH research, I wasn't very careful in terms of storing and cataloging my samples—and paid a high price. I didn't have the proper agreement with the lab where I was storing samples—they moved and didn't inform me and some samples were lost. Since then, I have become more particular with details and I learned to be sure to document things and have them properly done.

Another step you need to generate good science through research is by being clear about the way you ask questions and how you analyze the findings. The meanings can be very nuanced. Before my training, when I was a government scientist giving, say, interviews for newspapers, anything goes. But when describing research, you have to choose every letter—every sentence has a pregnant meaning, it has to be very carefully thought through. That discipline didn't come to me naturally, but I definitely like challenges.

### How did you become interested in research?

In medical school, I was planning to become a cardiologist. HIV was not on my radar screen, even though we did a lot of HIV care. It was emotionally draining, because that was a time when antiretroviral therapy hadn't begun in Kenya, so there wasn't much to do except treat opportunistic infections, counsel people and just send them home.

One of my first jobs was at the Ministry of Health and I was sent to an AIDS conference in Africa. I saw people presenting their data with a lot of confidence and flair, and found the generation of knowledge through research very exciting. That was my defining moment for research.

In my own work, the results of my cross-sectional study on HIV risk created awareness that the adolescent population was really at high risk. It led to a youth program, a national HIV prevention program. Regarding other research I have participated in over time, supported by NIH or others, some has transformed HIV prevention policy in Kenya, such as promotion of circumcision to prevent HIV transmission.

**“The enduring influence from Fogarty was through my MPH training and subsequent research, building my skills through research. It was transformative.”**

### What do you see in your future?

Being the first M.D./Ph.D. graduate in implementation science, it's hard to have an impact on your own. What would be very appropriate for me to do is to build capacity for implementation science, within the Ministry of Health, the universities and implementing agencies in health, and also mentor people who are interested in implementation science in my country. This will have a bigger impact than working alone. If we can build that capacity so that there's a critical mass of people suffused through the entire health sector, to me, that would be a very useful way of spending my time.

# Global Alliance partners publish hypertension findings

Research findings on behavior change strategies to reduce hypertension have been published by a consortium of scientists funded by the Global Alliance for Chronic Diseases (GACD). The Alliance, a partnership of international research funders, was formed to focus on implementation science that will lessen the burden of chronic diseases in low- and middle-income countries (LMICs) and among other vulnerable populations.

Scientists reported there was “marked variation” in the perceived capabilities, opportunities and motivation of the various entities being targeted for behavior change strategies to lower blood pressure (BP). “This suggests that the ability to change behavior differs greatly across regions and between actors,” the study team noted in a recent article in the journal, *Implementation Science*.

Hypertension was the GACD’s first research topic selected, with 15 projects funded to study how best to prevent, manage and control elevated BP. One of the greatest modifiable risk factors for disease, high BP is responsible for about 9.4 million deaths annually—with over 80 percent of those occurring in LMICs—according to the Global Burden of Disease 2010 study.

Although there was great variation in behavior change ratings, the scientists observed a high degree of synergy in the types of projects funded. Most were multifaceted, focusing on education and behavior change strategies. They drew on “softer” policy levers, such as guidelines, communication/marketing and service provision, rather than restrictive government regulation or legislation.

*Lifestyle modifications were among the interventions studied by hypertension researchers funded by the Global Alliance for Chronic Diseases.*

All of the research teams—working in 15 LMICs and Aboriginal communities in Canada—initially collaborated on a mapping exercise to study aspects of behavior change in their target populations and provide a benchmark to gauge progress. Projects broadly aligned to two topic areas—interventions in health care delivery, or measures to reduce salt intake or test salt substitutes.

The overarching program goals are to better understand barriers and facilitators at local and national levels, learn how innovations for BP control can be introduced and scaled up, and identify what health system elements must be strengthened to improve BP control and reduce health disparities.

By working together, the teams were able to synthesize common elements across research projects and encourage cross-fertilization of ideas. Another benefit of the GACD is the close relationship between the researchers and the funding agencies, the scientists said, so results can be used to inform future research funding calls.

Although the investigators had expected similar actors surveyed in each location to exhibit similar characteristics, they found there was a high degree of variability. That indicates the actors themselves and the local contexts in which they operate may be different. “Further, the interventions themselves, although similar in nature are complex,” the scientists said. “And the extent to which they are tailored to the regions in which they are working are likely to be a critical driver of outcomes.”

The actor-context-intervention relationships are key to understanding why similar interventions may produce different outcomes, and why similar actors may adopt interventions differently, according to the research partners. They said the main strength of the endeavor is the collaborative nature of the work and suggested their final process evaluations may hold important lessons for the broader global community.

“The outcomes of such activities are instructive for funding agencies and will help inform how global research programs can be developed into ‘implementation laboratories,’ thereby, delivering new knowledge that extends beyond the individual research projects that they fund,” the authors concluded.

The GACD has issued subsequent funding calls for diabetes and environmental lung disease research. A request for proposals related to mental health is being planned.



Photo by David Roehrkamp for Fogarty

## RESOURCES

Article: <http://bit.ly/GACDhypertension>

Website: [www.gacd.org](http://www.gacd.org)

# South African cohort studies yield key health insights

South Africa's population faces converging epidemics, as infectious diseases like HIV persist, while noncommunicable diseases (NCDs) and injuries become more common. NIH is supporting research in the impoverished rural region of Agincourt, where scientists hope their findings will lead to harm-reduction and prevention policies. Two of the researchers spoke recently at an NIH meeting organized by Fogarty.

"We are seeing tremendous collisions," said Dr. Stephen Tollman, who directs a research group that has been collecting data on the Agincourt population for more than two decades. He and Dr. Kathleen Kahn are on teams conducting intervention studies based on the cohort. "Chronic infection and chronic NCDs are intersecting in mortality across the age range and also in terms of the risks," Tollman noted. "This is a major challenge to health care systems and social development."

Tollman's group—the Medical Research Council/Wits Rural Public Health and Health Transitions Research Unit—is based at the University of the Witwatersrand. It includes some 30 doctoral graduates and a similar number enrolled from the region and around the world—supported by NIH and others—and is working to establish a national network of surveillance-based research. Starting in 1993, the Agincourt cohort has enrolled about 115,000 participants, who are being followed through the years, and has led to more than 500 peer-reviewed papers in the last decade.

Data across the lifespan from such a large population are a valuable research resource, Fogarty Director Dr. Roger I. Glass, noted. "This longitudinal cohort provides extraordinary opportunities to study everything from child health, to genetics, to aging, and to conduct intervention studies you cannot do in any other way."

Myriad influences contribute to the overall health picture in Agincourt, including education levels, social environment and care systems. In one study, researchers sought to determine the main causes of death, since half the population dies at home without physician involvement. Verbal autopsies on these people showed many were killed by HIV and tuberculosis, but also prevalent were hypertension, cardiovascular disease and metabolic conditions, Tollman said. For instance, older women were as likely to have died of a stroke as HIV/AIDS. He noted among the factors fueling chronic disease are stunting during childhood and a rising incidence of obesity in young women.

Photo by Georges Keniers



Scientists in South Africa tackle chronic and infectious diseases to support policymakers as they determine effective interventions.

The Agincourt team continues to research infectious diseases, as well as NCDs. Access to antiretroviral therapy and other positive influences are reining in the HIV/AIDS epidemic, but new infections remain high, particularly among young women—30 percent of whom are HIV-positive—as well as older persons.

Kahn, Tollman and their team recently studied whether offering cash payments to encourage teens to remain in high school would reduce their HIV risk. Although the study of 2,500 women did not show a lower rate of new HIV infections compared with controls, participants nonetheless reported fewer sexual partners, less unprotected sex and lower intimate partner violence, Kahn noted. The team is now investigating whether providing self-administered HIV tests for young women and their partners avoids the fear of stigma, which can discourage clinic visits. "Stigma is something that needs to be addressed," Kahn noted. "It's so vital to understand, because it undermines efforts to expand testing and access to care."

Tollman and Kahn said many social changes are underway in South Africa and studies are vital to illuminate their influence on health. These include urbanization, near universal pension income and females in the migrant workforce. NIH's National Institute on Aging is contributing support to a study on how aging conditions in Agincourt affect physical and cognitive well-being over time. Other NIH funders active in the region are the National Human Genome Research Institute, National Institute of Mental Health, National Institute of Allergy and Infectious Diseases and National Institute of Child Health and Human Development. Fogarty has supported several projects in Agincourt and now funds related training at Wits University.

## RESOURCE

Website: [www.agincourt.co.za](http://www.agincourt.co.za)



*Dr. Christopher Murray discusses insights from the Global Burden of Disease study and new directions for the project.*

## Murray discusses Global Burden of Disease findings

By Shana Potash

**T**he risk factors and diseases that threaten health globally have changed significantly in the past few decades, as highlighted by the latest Global Burden of Disease (GBD) study.

The rise in noncommunicable diseases; scientific debates that come with assessing the world's health; and future plans for the GBD project were the focus of a recent NIH talk by Dr. Christopher Murray. He is a founder of the GBD program and director of the Institute for Health Metrics and Evaluation (IHME) at the University of Washington.

### Insights on shifting disease burden

Communicable, maternal, neonatal and nutritional disorders have steadily declined around the world, while the volume of noncommunicable diseases (NCDs) has exploded, driven by population growth and an aging population. Health systems need to account for that in financing and planning, Murray said, as he presented analyses of GBD data from 1990 to 2013, published in *The Lancet* last year.

He pointed out other challenges that emerge when examining the years people spend living with disability. Back pain, diabetes, vision and hearing loss, depression and other mental health disorders are among the leading issues. But, cancer and cardiovascular disease, which are the classic causes of premature death, aren't big contributors to disability.

"What ails you, isn't necessarily what kills you," Murray explained. "It's this disconnect health systems need to deal with."

Another observation from the GBD, he noted, is the enormous role tobacco use and high blood pressure play in causing NCDs, along with unhealthy diets. In 1990, the biggest threats to health globally were malnutrition and unsafe water and sanitation. By 2013, they'd been replaced by poor diet and high blood pressure, with tobacco use not far behind.

Behavioral risk factors, followed by metabolic and environmental issues, are significant determinants of health and can explain about 40 percent of the burden globally, he observed. "I think there are important insights on the behavioral risks that are going to come from not only the epidemiology and traditional analysis of risks, but understanding how to change behavior, which of course is quite complex," he said, giving a nod to social science.

### Spurring scientific and policy debates

Murray is encouraging scientists and policymakers to use GBD data and visualization tools in their own research. The project website enables easy manipulation of data and creation of downloadable graphics. During their visit to Bethesda, Murray and his team trained 60 NIH staff on how to use the tools.

The GBD quantifies health loss from disease, injuries and risk factors by age, sex, population, and over time. It uses multiple metrics including death statistics, disease prevalence and an overall measure for the burden of disease known as disability-adjusted life years (DALYs). DALYs are the sum of years of life lost to early death and years living with disability.

There's GBD data on over 300 diseases and injuries from 188 countries back to 1990. More than 1,400 collaborators in 115 countries collect, review and analyze information from about 50,000 sources. Metadata for those sources are available in an online catalog, the Global Health Data Exchange.

"There's a lot of complexity to trying to make sense of the world's health data," Murray commented as he described efforts to ensure content is credible, comparable and

comprehensive. Uncertainty quantification, he said, is a critical component of the burden and tries to reflect uncertainty in both the model and in the underlying data.

He acknowledged recent debates around the GBD that have taken place internally among the staff, as well as externally. Hypertension was one example. The GBD asserted that risk starts when systolic blood pressure is 110-115, but some people questioned whether there really are benefits below 140-150. Murray said he was happy to see that a recent NIH study known as SPRINT found health benefits in being closer to 120, confirming the GBD analysis.

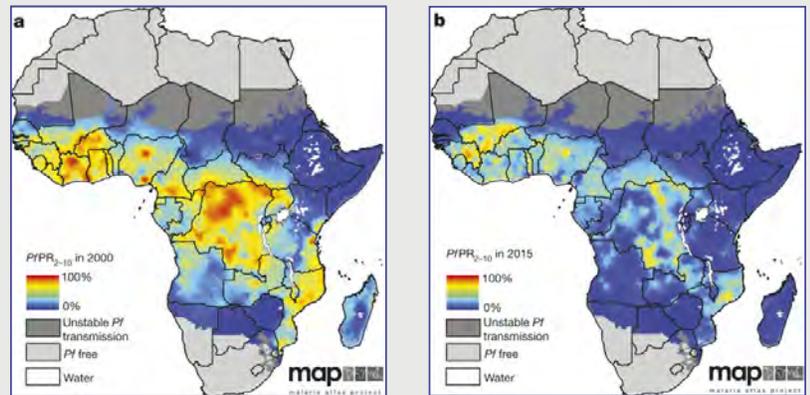
Salt was another hotly debated topic. Murray said there was no scientific agreement on the optimum daily level of sodium intake, so the GBD assessed burden was based on a range of 1-5 grams. As the science on sodium evolves, the argument for a population-level strategy to reduce intake is compelling, he noted.

**Future directions for the GBD**

New tools and data are in the works to provide researchers and policymakers with a more detailed picture of what's killing and ailing people, where and why.

IHME is developing mapping software to help guide the fight against the most problematic infectious diseases in low-income countries. Geospatial mapping techniques will be applied to show the disease burden of malaria,

**The Effect of Malaria Control 2000-2015**



Source: Nature article: <http://bit.ly/MAPstudy>

HIV, tuberculosis, diarrhea and pneumonia, as well as three neglected tropical diseases: lymphatic filariasis, onchocerciasis and human African trypanosomiasis.

The work will be similar to the Malaria Atlas Project (MAP), Murray explained, pointing to a recent MAP study and visualizations in *Nature* that quantified the effect of malaria control efforts in sub-Saharan Africa. Dr. Simon Hay, a recent Fogarty Senior Research Fellow who co-founded MAP, is the new head of geospatial science at the IHME and is leading the effort.

A tool to forecast disease burden up to 25 years out also is being created by IHME. Users will be able to ask “what if” questions by changing the trajectory for risk or income, for example. Murray encouraged the audience to “imagine the various uses that type of forecasting tool has for giving you a background, past trends and relationships scenario to think about alternatives where your innovations here might change the course of that scenario.”

The GBD is moving to annual updates, with the next one planned for release in May 2016. It will include, for the first time, assessments for the U.S. by state, as well as sub-national measures for Brazil, Sweden and Japan.

**Training and capacity building**

Government officials in the United Kingdom, China and India are using GBD results, Murray said, and the growing interest in this type of descriptive epidemiology and data synthesis will require more training and capacity building.

“Above and beyond the traditional training in biostatistics and epidemiology, there are extra techniques and skills that need to be taught,” he said, adding that the training the IHME currently provides “is a drop in the bucket compared to what’s needed.”



Metabolic risks  
 Environmental/occupational risks  
 Behavioral Risks

**RESOURCES**

Lecture videocast: <http://bit.ly/GBDVideocast>  
 Website: [www.healthdata.org](http://www.healthdata.org)

# OPINION

By Dr. Roger I. Glass, Director, Fogarty International Center

## The Global Alliance for Chronic Diseases: a partnership blossoms



The new year brings fresh enthusiasm to tackle our most pressing global health challenges—especially the emerging tide of chronic, noncommunicable diseases that threaten the progress we've made against HIV and infectious diseases in low- and middle-income countries.

I'm encouraged by the great strides we've made in building an international collaboration to address this problem,

the Global Alliance for Chronic Diseases. Begun in 2007 with four founding members, the partnership has grown to include the European Commission and research funding bodies in nine countries—Argentina, Australia, Canada, China, India, Mexico, South Africa, the U.K. and the U.S.—with more preparing to join. The GACD was established to facilitate collaborative funding activities for innovative, original research directed at the prevention and treatment of chronic diseases. Celina Gorre is the Executive Director of the GACD Secretariat, which is hosted by the University College London.

The amount invested has risen with each GACD funding call, from \$22 million for research on hypertension in 2011, to \$30 million for diabetes in 2013, to \$50 million for lung disease in 2015. Another metric of growth is the increasing attendance at the annual scientific meetings, with the most recent attracting more than 100 scientists.

GACD participants decided that funded research projects should meet several criteria. They must involve local policymakers from the outset, with a commitment to investigate research on the implementation of programs that could be scaled up if successful. Clinical outcomes should be measured—for example, a reduction in the incidence of stroke or a drop in the prevalence of untreated hypertension. The research should not cause human and other resources to be diverted from local health systems. Deliverables should include a toolkit that can be used to scale up successful programs. Finally, and significantly for Fogarty, each project should include a training and capacity building component.



GACD's management committee: Drs. Cao, Beaudet and Gray.

The GACD leadership has successfully navigated numerous issues of governance and the mechanics of operation. We hope to reach the stage where we can conduct joint peer review and there are metrics that show this is a viable goal.

We are in good hands with a management committee made up of new chair Dr. Alain Beaudet, president of the Canadian Institutes of Health Research, future chair Dr. Glenda Gray, president of South Africa's Medical Research Council, and past chair Dr. Xuetao Cao, president of the Chinese Academy of Medical Science. At our recent meeting, I was pleased to observe that three former Fogarty trainees are engaged in this important effort—Gray, Dr. Soumya Swaminathan, director general of the Indian Council of Medical Research, and Dr. Daniel Gomez, of Argentina's Ministry of Science, Technology and Productive Innovation. This assemblage of talent is a powerful testament to the impact of Fogarty's capacity building programs.

As a member of the GACD Board, I am proud to represent NIH, which now has nine entities as committed collaborators: the National Cancer Institute (NCI), National Heart, Lung and Blood Institute (NHLBI), National Institute of Biomedical Imaging and Bioengineering (NIBIB), Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), National Institute of Environmental Health Sciences (NIEHS), National Institute of Mental Health (NIMH), National Institute of Neurological Disorders and Stroke (NINDS), the Office of Research on Women's Health (ORWH) and Fogarty. Dr. Pamela Collins and colleagues at NIMH will help lead the upcoming scoping exercise, to determine how best to structure a call for proposals to study implementation issues related to the mental health agenda. And NHLBI and NINDS may play an active role in discussions to plan a new funding call to engage countries that are studying interventions for hypertension.

To accelerate discovery, we need to access the brainpower of researchers around the globe. The GACD today provides a new path to advance research in prevention and cures by joining together the world's largest funders to develop scientific networks that could improve the lives of us all.

Photo courtesy of GACD



## Smith assumes role as new USAID Administrator

Gayle E. Smith has been sworn in as the new USAID Administrator. She most recently held positions as special assistant to the President and senior director at the National Security Council, where she led global development, democracy and humanitarian assistance initiatives.



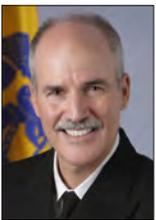
## Fogarty grantee leads Canadian Academies Council

Dr. Eric M. Meslin has been named president and CEO of the Council of Canadian Academies. He is founder and director of Indiana University's bioethics center and has managed a Fogarty grant for ethics training at Moi University in Kenya.



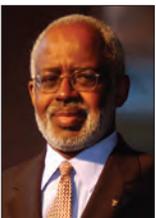
## Explorers Club honors Fogarty grantee Hay

Understanding what's killing the world's coral reefs has been the career focus of Dr. Mark Hay, of the Georgia Institute of Technology. The Fogarty biodiversity grantee has received the Lowell Thomas Award from the New York-based Explorers Club, which cited his leadership in developing innovative and effective approaches for coral reef conservation.



## Fogarty Deputy honored for service in Africa

Fogarty Deputy Director Dr. Peter H. Kilmarx has received the Paul Harris award from the Harare Rotary Club, in recognition of his work on HIV in Zimbabwe and Ebola in West Africa. Until July, Kilmarx was the CDC Country Director in Zimbabwe. The award was created in memory of the Club's founder to acknowledge outstanding contributions.



## Fogarty board member is named chief diversity officer

Vanderbilt University has chosen Dr. George C. Hill to be its first chief diversity officer and vice chancellor for equity, diversity and inclusion. Hill, a molecular biologist, was elected to the National Academy of Medicine in 1998 and is a member of Fogarty's Advisory Board.



## McConnell is the first US Health Attaché in Mexico

Dr. Michelle S. McConnell has been appointed as the first U.S. Health Attaché in Mexico. Her prior post was at CDC Vietnam, where she was Country Director. A pediatrician, McConnell has researched many aspects of HIV, including mother-to-child transmission.



## DuBois is the new US Health Attaché in Brazil

Former U.S. Health Attaché in India, Dr. Amy DuBois, has been selected to assume the same position in Brazil. She previously served in the Office of the Global AIDS Coordinator and in the CDC's offices in Mozambique and Atlanta.

## G-Finder reports global health funds rise

The Global Funding of Innovation for Neglected Diseases (G-FINDER) 2014 survey reports that investments rose to \$3.4 billion, including \$165 million for Ebola research and development. NIH support accounts for about 38 percent of the total. G-Finder is produced by the nonprofit Policy Cures, with funding from the Bill & Melinda Gates Foundation.

Website: <http://bit.ly/neglec-dis>

## WHO studies tobacco marketing in LMICs

Populations in low-income countries see over 80 times more tobacco advertisements than those in high-income countries, especially in urban communities, a WHO study found. The survey included nearly 12,000 people in 16 countries.

Full report: <http://bit.ly/WHO-tob-sale>

## Alzheimer's biomarker tool available

Scientists aiming to improve early diagnosis, monitoring and treatment efficacy in Alzheimer's disease can access global scientific reports and meta-analyses on fluid and imaging biomarkers in a new database, AlzBiomarker. The resource was compiled by an international collaboration.

Website: <http://bit.ly/Alz-bio>

## WHO says 3.2 billion people risk malaria

Although the number of malaria cases fell globally in 2015, about 3.2 billion people—nearly half the population—remain at risk, according to the WHO's World Malaria Report 2015. An estimated 438,000 people have died in the past year, down 60 percent since 2000. Africa carries the heaviest burden, accounting for about 90 percent of malaria incidence and death, where a third of at-risk people have no bed nets or indoor spraying.

Website: <http://bit.ly/WHO-malaria-15>

## WHO assesses foodborne disease burden

Foodborne diseases strike 600 million people annually and kill about 420,000, mainly in Africa and Asia, according to the WHO. A global study assessed diseases stemming from 31 hazards, including 11 diarrheal pathogens, 7 invasive infectious agents, 10 helminths and 3 chemicals.

Full report: <http://bit.ly/WHOfoodreport>

Funding Opportunity Announcement	Details	Deadline
Household Air Pollution (HAP) Health Outcomes Trial (UM1)	<a href="http://bit.ly/HAP-2016">http://bit.ly/HAP-2016</a>	Jan 19, 2016
Fogarty Global Injury and Trauma Research Training (D43)	<a href="http://bit.ly/tr-inj-2016">http://bit.ly/tr-inj-2016</a>	Feb 24, 2016
Global Noncommunicable Diseases and Injury (R21)	<a href="http://bit.ly/NCD-injury">http://bit.ly/NCD-injury</a>	Feb 24, 2016
Planning Grant for Emerging Epidemic Virus Research Training for West African Countries with Widespread Transmission of Ebola—Guinea, Liberia, and Sierra Leone (D71)	<a href="http://bit.ly/virus-D71">http://bit.ly/virus-D71</a>	Feb 24, 2016
International Research Scientist Development Award (IRSDA) (K01)	<a href="http://bit.ly/IRSDA2016">http://bit.ly/IRSDA2016</a>	Mar 2, 2016
Global Infectious Disease Research Training Program (GID) (D71) (D43)	<a href="http://bit.ly/GID-D71">http://bit.ly/GID-D71</a> <a href="http://bit.ly/GID-D43">http://bit.ly/GID-D43</a>	July 29, 2016 July 29, 2016
Emerging Global Leader Award—Career Development (K43)	<a href="http://bit.ly/K43-2016">http://bit.ly/K43-2016</a>	Dec 14, 2016

For more information, visit [www.fic.nih.gov/funding](http://www.fic.nih.gov/funding)

## Global Health Matters

January/February 2016

Volume 15, No. 1 ISSN: 1938-5935

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## NIH unveils NIH-Wide Strategic Plan for 2016-2020

The NIH has developed a new strategic plan to ensure the agency remains well positioned to capitalize on new opportunities for scientific exploration and address new challenges for human health.

“Scientific and technological breakthroughs that have arisen from NIH-supported research account for many of the gains that the United States has seen in health and longevity,” said NIH Director Dr. Francis S. Collins. “But much remains to be done. This strategic plan will guide our efforts to turn scientific discoveries into better health, while upholding our responsibility to be wise stewards of the resources provided by the American people.”

The plan focuses on four interdependent objectives that will help guide NIH’s priorities over the next five years:

- advance opportunities in biomedical research in fundamental science, treatment and cures, and health promotion and disease prevention
- foster innovation by setting NIH priorities to enhance nimbleness, consider burden of disease and value of permanently eradicating a disease, and advance research opportunities presented by rare diseases
- enhance scientific stewardship by recruiting and retaining an outstanding biomedical research workforce, enhancing workforce diversity and impact through partnerships, ensuring rigor and reproducibility, optimizing approaches to inform funding decisions, encouraging innovation, and engaging in proactive risk management practices
- excel as a federal science agency by managing for results by developing the “science of science,” balancing outputs with outcomes, conducting workforce analyses, continually reviewing peer review, evaluating steps to enhance rigor and reproducibility, reducing administrative burden, and tracking effectiveness of risk management in decision making

Over the next five years, NIH leadership will evaluate progress in meeting the plan’s objectives. The complete strategic plan is available at <http://bit.ly/NIHStratplan>.

