

Inside this issue

H3Africa program spurs genomic research and training . . . pgs. 5 - 6



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US, Canada invest \$21 million in LMIC research hubs



Pesticide use, household and outdoor air pollution, mining hazards and other occupational and environmental risk factors cause almost a quarter of the world's deaths, according to the WHO. The greatest burden of disease from these exposures occurs in low- and middle-income countries (LMICs), where there is limited capacity to study the links between these risk factors and illness. Meanwhile, more than two million workers around the world die every year due to occupational injury or illness, costing the global economy billions of dollars, as reported by the International Labour Organization.

To address these critical problems, the U.S. and Canada are partnering to invest \$20.9 million dollars over five years to establish seven regional research and training centers, called Global Environmental and Occupational Health (GEOHealth) Hubs. Each hub will be based in an LMIC and consist of a multidisciplinary group of researchers and partner organizations who will collaborate on common research and training topics

. . . continued on p. 2

GEOHealth Hubs will support research on pesticide use, air pollution, mining hazards and other occupational and environmental risk factors.

US scientists explore research collaborations with Cuba

By Ann Puderbaugh

PHILADELPHIA - The recent thaw in U.S.-Cuban relations may provide opportunities to expand scientific partnerships between the countries, a topic explored in a panel discussion at the recent American Society of Tropical Medicine and Hygiene (ASTMH) annual meeting.

“Cooperation in health and science focuses our efforts on a goal that’s easy to understand and share—the goal of a healthier world,” noted Ambassador Jimmy Kolker, who is Assistant Secretary for Global Affairs at HHS. “Our close proximity means that we share waters and are impacted

by the same environmental factors and the same tropical storms. As travel increases, communicable diseases will move even more between our countries and collaboration will be increasingly important.”

With a life expectancy on a par with the U.S., Cuba has useful lessons to offer, Kolker observed. “It is exceptionally important that Cuba became the first country ever in the whole world to eliminate mother-to-child transmission of HIV and syphilis.”

. . . continued on p. 3

FOCUS

Brain disorders across the lifespan

Research to advance neuroscience health worldwide



Nature supplement: Brain disorders across the lifespan

- NIH-led effort details global research agenda
- Recent discoveries hold promise for rapid progress
- Neglected field needs more attention, resources

Read more on pages 8 – 9

US, Canada invest \$21 million in LMIC research hubs

. . . continued from p. 1



GEOHealth Hubs will research mining hazards, including those caused by informal gold mining, shown above, in Peru.

that address environmental and/or occupational health issues.

Hubs are supported by two linked awards—one to an LMIC lead institution for research on key topics of regional importance and another to a U.S. institution to oversee relevant research training. The hubs are intended to become internationally recognized centers for the collection, management, synthesis and interpretation of data on environmental and occupational health.

Together, the seven hubs will form the GEOHealth Network, a platform to build LMIC research leadership in environmental and occupational health, and foster the exchange of knowledge and use of evidence to inform policies.

Fogarty is coordinating and partially funding the awards, in collaboration with NIH partners—the National Cancer Institute and National Institute of Environmental Health Sciences. Also providing support is the National Institute for Occupational Safety and Health, part of the CDC. Canada's International Development Research Centre is contributing to the funding of research led by LMIC scientists. The Global Alliance for Clean Cookstoves is also participating in the GEOHealth program by offering supplemental funding for research and training focused on household air pollution.

“We know that air and water pollution, pesticide exposure, climate change and other environmental and occupational risk factors contribute to the growing burden of noncommunicable diseases in LMICs,” said Fogarty Director Dr. Roger I. Glass. “These research hubs are designed to develop a critical mass of scientists who can

discover how these exposures trigger diseases, identify effective interventions and spur policy changes that will improve health.”

The overall goals of the GEOHealth Hubs are to strengthen environmental and occupational health-related research collaborations, accelerate scientific infrastructure development, enhance research training, create relevant advanced educational curricula and outreach material, support research needed to address environmental and/or occupational exposures, and inform nationally relevant policy development in LMICs.

Neurotoxins related to mining and agricultural development and their impact on maternal and child health throughout the Caribbean will be examined from a hub based in Suriname. Meanwhile, scientists at a center in Thailand will investigate pesticides commonly used in agriculture across Southeast Asia, to see if they act as endocrine disrupters, increasing the risk of metabolic syndrome and associated diseases such as diabetes, stroke and heart disease.

A hub in India will focus on air pollution and developing the scientific expertise to study the unique characteristics



Photo courtesy of the University of Southern California

Researchers with the Ethiopian GEOHealth Hub, shown here monitoring air quality, will study air pollution, climate change and occupational health throughout eastern Africa.

of exposures in that country, while a center in Bangladesh will address household air pollution, climate change and the garment worker industry. Another hub, in Peru, aims to build scientific capacity and support research on air pollution and climate change,

with links to the neighboring countries of Ecuador, Bolivia and Chile.

A hub based in Ethiopia will develop spokes in Kenya, Rwanda and Uganda to study air pollution, climate change and occupational health related to temperature. Finally, research and training in West Africa will focus on health threats from electronic waste, gold mining and transportation-related ambient air pollution, led from a center in Ghana.

RESOURCES

Full list of awards: <http://bit.ly/GEOHubs>

US scientists explore research collaborations with Cuba

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Cuba is also renowned globally for its expertise in disaster response. It mobilized the Cuban Medical Brigade to combat the Ebola outbreak where, in some instances, Cubans worked side-by-side with Americans. “We witnessed science in action most recently in West Africa,” said Fogarty Director Dr. Roger I. Glass, who moderated the discussion. “Imagine if you could, dream if you will, Cuban physicians working in an American hospital to address a global threat.”

Leading Cuba’s Ebola response was Dr. Jorge Delgado, who said 12,000 Cuban health care workers volunteered for the mission because “human beings are human beings.” About 250 were selected and traveled to West Africa after training. One died of cerebral malaria while on duty there.

In the last 55 years, the Brigade has worked in 160 countries, treated countless patients and saved an estimated 5 million lives, Delgado noted. The Brigade has responded to numerous hurricanes, earthquakes, floods and other disasters around the globe.

The life expectancy of Cubans is similar to the U.S., so Cuban health officials are facing the same health problem as the U.S.—an aging population, reported Dr. Lupe Guzman, the head of virology at the Pedro Kouri Institute of Tropical Medicine in Havana. Of the country’s 11 million inhabitants, nearly 20 percent are older than 60, and that’s expected to rise to about one-third of the population in the next 50 years. Cancer is already among the top three causes of death in her country, Guzman said.

With chronic, noncommunicable diseases a shared interest, there are numerous promising areas for research collaboration, Kolker proposed. Neurodegenerative diseases such as Alzheimer’s pose huge health and resource issues for both countries. Cuba’s planned national dementia registry and the U.S. Brain Initiative may find common ground, he said.

Infectious diseases—such as chikungunya, dengue and flu—remain challenging for the U.S. and Cuba. With tourism to the island nation bringing more than 3 million visitors each year, and expected to rise, diseases are spreading faster. Scientists could make quicker progress by working together, Guzman noted, “We have some relationships and ongoing collaborations. The point is to increase and strengthen these.”

Nurturing these partnerships is the Pan American Health Organization (PAHO), WHO’s regional office for the Americas. “It’s a great opportunity to advance collaborations, increase people-to-people contacts and make significant contributions to global health,” said Dr. Marcos Espinal, PAHO’s director of communicable diseases. “PAHO is very pleased to be a broker between these two member states.”

Indeed, PAHO—together with ASTMH—sponsored the Cuban scientists’ travel to the U.S. to speak at the conference, the first Cubans ever to participate in the annual Trop Med meeting. It was a momentous occasion, said Guzman. “Many times, we have met in Cuba or some other place, but to meet here is very special.”

“Cooperation in health and science focuses our efforts on a goal that’s easy to understand and share—the goal of a healthier world.”

— AMBASSADOR JIMMY KOLKER
HHS ASSISTANT SECRETARY FOR GLOBAL AFFAIRS

Despite the improved relations between the two countries, Kolker injected a note of caution that progress may be slower than desired. “Diplomatic relations are not a light switch that can be turned on,” he noted. “Trust needs to be built; it cannot be taken for granted. And I look forward to facilitating that trust and understanding.”

Cuba is the first country that has eliminated mother-to-child transmission of HIV and syphilis, among the topics U.S. scientists might explore with their Cuban counterparts, as relations between the two countries improve.



PROFILE

Fogarty Fellow advances cancer research in Zambia

By Cathy Kristiansen

Dr. Akwi Asombang wondered about incorporating global health research into her career. While she was in the midst of a gastroenterology fellowship at Washington University School of Medicine, she decided to test the waters by applying for a Fogarty fellowship in Zambia. She was selected and embarked on an experience that would guide her future.

“It was absolutely amazing, it solidified my interest in global health and how I see myself,” she said of the fellowship, funded by Fogarty’s Global Health Program for Fellows and Scholars, which provides yearlong mentored clinical research experience overseas for postdoctoral fellows and pre-doctoral scholars. The National Cancer Institute also contributed support. She recalls, “I was able to see opportunities for research, the vast need for more data.”

Her fellowship research project examined how antioxidants ward off cell-damaging oxidative stress, which is suspected as a cause of cancer. Fruits and vegetables are key sources of antioxidants. Asombang found although the typical Zambian diet is dominated by vegetables rather than animal products, additionally eating fruits year-round was protective against gastric cancer. Her study also clarified that higher levels of urinary isoprostanes—a biomarker of oxidative stress—were associated with gastric cancer.

Asombang is especially interested in the early occurrence of gastrointestinal cancers in the Zambian population. These are often undiagnosed or identified too late to treat effectively. The country has few gastroenterologists and lacks relevant data to guide treatment strategies and health policy. “I went there with the intention of looking at gastric cancer,” she recalls. “But then I encountered esophageal cancer cases, so our team decided to pursue that as well. Along the way, I got more intricately involved with patient care, a welcome addition to my research portfolio.” Asombang has continued to study not only gastric cancer but also esophageal, colorectal and pancreatic cancers. She is now an assistant professor at the University of Missouri and returns periodically to Zambia to continue her research, having secured further grants after her fellowship. Based on networking done at that time, she has also been invited to lecture at the Lusaka Apex Medical University in Zambia.



Akwi W. Asombang, M.D., M.P.H., F.A.A.P.

Fogarty Scholar: 2010 – 2012

Fellowship at: University of Zambia School of Medicine

U.S. partner: Washington University

Research topic: Antioxidant status as a gastric cancer risk factor in a Zambian population

Asombang recalls one eye-opening revelation during her fellowship—the difficulty of obtaining laboratory tests, which impacted both research and routine patient care. In the U.S., she was used to receiving laboratory results promptly, even within hours, but her work in Zambia required more hands-on involvement such as collecting blood and urine samples and delivering them to the respective labs. She noted, “Things we take for granted here—the availability of manpower, the limitless supply of the different equipment and tests we use—were not routinely available in Zambia.”

She found it necessary to learn some new laboratory techniques, such as making dry ice for storing and transporting samples. She recalls, “We got a tank of carbon dioxide and attached it to a dry ice maker, then transferred it into a secure container. The room became cloudy and we laughed at the fun of it.”

Aside from being surprised by a number of logistical challenges during her fellowship, Asombang found some emotional aspects difficult. She diagnosed a 19-year-old woman with colon cancer and, although she arranged for the best care possible, she heard the woman had died a year later. “I built such a bond with her,” she remembers. “Her aunt, who used to bring her to the clinic, named her own daughter after me.”

Asombang said she is now much more aware of the challenges in resource-limited settings and the great need for more research and clinical interventions. “Being on the ground helped me understand the burden of disease and opportunities for improvement in both patient care and clinic education,” she noted. “I believe I am in a stronger position to continue to contribute to what is known about gastrointestinal cancers in Zambia and neighboring countries.”

NICOLA MULDER, PH.D.

Dr. Nicola Mulder is a Professor at South Africa's University of Cape Town and heads its bioinformatics center, the Computational Biology Group, which is playing a leading role in developing H3ABioNet, the NIH-funded Pan-Africa Bioinformatics Network for Human Heredity and Health in Africa (H3Africa). She is one of the founding members of the Global Organisation for Bioinformatics Learning, Education and Training. Mulder has a Ph.D. in medical microbiology and spent nearly a decade at the European Bioinformatics Institute in the U.K.



What is H3ABioNet and why is it important?

Basically, it's a Pan-African bioinformatics network to build capacity for genomics research in Africa. It includes over 30 institutions on the continent and two abroad. We are in existence because the H3Africa program is going to be generating a lot of data from multiple projects, multiple sites and different types of data from clinical, metagenomics and pharmacogenomics studies. We need to manage, store, process and interpret this data to turn it into knowledge. Historically, researchers in Africa have sent their samples overseas and got somebody else to analyze the data. Our network wants to switch that mentality and empower the African scientists to do their own research, do the data interpretation and do the analysis. If somebody else handles your data, it's much harder to go back and say, 'Well, have you tried this, have you tried that, what about this?' whereas if you start the analysis from scratch, you have the power to do that. Generally, they haven't had the resources, or the training to do this before.

What progress have you made?

We've held 19 workshops, trained about 456 people and also placed 25 fellows in one- to two-month internships. Bioinformaticians usually need specialized training, as do bioinformatics users. Clinicians and geneticists doing the science have seldom been trained in statistics, large-scale data manipulation and analysis. Actually, bioinformatics is one of the cheapest sciences you can do, because you don't need lab equipment—you need the data and somebody to work with it on a computer. It does bring challenges because the Internet is essential and speed is generally very poor in Africa, let alone when the electricity goes down. Another challenge is the lack of infrastructure for people to work with when they get home after training.

To sustain the program, we are developing trainers and supporting institutions as they establish their own degree programs. In the first two to three years, all the trainers were international, but then it started switching over and some courses have gone 80-100 percent local, others perhaps 50 percent local. The University of Bamako in Mali just launched their first master's degree program in bioinformatics, institutions in Kenya are going to start soon, and some in Tanzania and Nigeria also want their own program. Some institutions have managed to leverage

research funding and, in general, scientists are more confident to write grants together and explore new research opportunities.

What training is needed?

There are various kinds of specialized training. We split it into the bioinformatics user, the bioinformatics scientist and the bioinformatics engineer. And you need people across that spectrum. So some in the genetics lab will be the users—take the results coming out of big pipelines and then do the downstream analysis and the interpretation of the data. They just need a little bit of computational skills to know the programs to use, how to move data around and how to visualize and interpret it.

Your engineer is on the technical side, developing the algorithms, setting up the pipelines on the high performance cluster, making sure that there's sufficient storage available that they can process on and setting up the infrastructure. Because the data's becoming so big, there's no way you could run it on a PC, so people are having to look at Cloud solutions and other options.

Then you've got your scientist who's really doing quite a lot of the data analysis and the interplay between the user and the engineer. In terms of interpretation, they need to ask, 'Is it making sense statistically, is there the power to say what I'm saying about this set of samples, is it valid?'

How do you see genomics developing in Africa?

When you've got the data and you know what to do with it, that can lead to new discoveries, because there are so many ways you can look at the same dataset. You give it to one group and they'll come up with one answer, you give it to another group and they'll ask a totally different question of the same data. So, empowering African scientists to think out of the box is paving the way for novel discoveries. We're trying to impress upon people that just because you're in Africa with limited resources, it doesn't mean you're going to be behind in the field, you can find a niche area and you can lead the field.

RESOURCE

Website: <http://H3ABioNet.org>

H3Africa spurs range of genomic research, training

By Cathy Kristiansen

African scientists have begun to study genomic influences on disease across their continent, from differences in the progression of HIV in children, to sleeping sickness susceptibility, to treatment response in sickle cell disease. They recently described their research and training programs, supported by the Human Heredity and Health in Africa (H3Africa) initiative, at a meeting on the NIH campus. NIH and the Wellcome Trust launched H3Africa five years ago to foster genomic and epidemiological research in African scientific institutions.

The achievements to date of this \$74-million multiyear program, managed in partnership with the African Society of Human Genetics, have been “remarkable,” according to NIH Director Dr. Francis S. Collins. For instance, H3Africa has enrolled 20,000 participants in research and is currently training 250 Africans in genomics-related topics. The H3ABioNet has established 37 bioinformatics training locations in 17 countries; and Uganda, Nigeria and South Africa have developed biorepositories. Collins said, “I do believe H3Africa is creating a critical mass of research capability in the institutions that are involved.”

Also underscoring H3Africa’s progress was Wellcome Trust board’s deputy chair, Dr. Kay Davies. “The genomics revolution in Africa is well under way,” she said. “Networks are going particularly well in bioinformatics. Transformation is what we are producing.”

Several H3Africa-funded researchers at the meeting described their ongoing projects. Newborns with HIV usually fall ill within three years, but some children contain the virus for up to a decade. Dr. Gabriel Anabwani, of the Botswana-Baylor Children’s Clinical Center of Excellence, and his team have flagged for further study more than a dozen genes that might play a role.

Human African trypanosomiasis, or sleeping sickness, is hard to treat by the time it is typically diagnosed. Some people suffer disability or death, but others can eliminate the culprit parasites from their body. Dr. Enock Matovu and colleagues at Uganda’s Makerere University are comparing genes in susceptible and resistant people,

hoping to spur new diagnoses and treatments. They have sequenced the genomes of 180 people so far and additionally contributed to Uganda’s biobank.



An older woman holds an infant in a rural village near Gulu, Uganda.

© 2009 Jessica Alderman, courtesy of PhotoShare

Concentrations of nose and throat microorganisms may play a role in pneumonia—a leading killer of young children—and asthma. Scientists at the University of Cape Town collected more than 35,000 nasal swabs from children to show how different strains of *Staphylococcus aureus* ebb and flow, depending on the child’s age. “We have been able to set up a fantastic [research] backbone using our H3Africa funding and collecting novel data,” said team leader Dr. Mark Nicol. This group will continue its analysis of colonization patterns and health risks. Other H3Africa research at the university is deepening understanding of sickle cell disease—long known to be a genetic condition but with variable symptoms difficult to predict—to identify the most appropriate

public health interventions. Dr. Ambrose Wonkam and his colleagues have recruited 350 participants, held focus groups, conducted in-depth interviews and applied for several grants to conduct additional research.

Both genetic and environmental factors influence stroke, which is a major health burden in Nigeria. To identify stroke risk factors, Dr. Mayowa Owolabi and his team at the University of Ibadan first developed software to standardize data on the stroke type, installed solar panels for consistent power supply, produced a documentary to boost recruitment and devised a plan to use mobile phone reminders to retain study participants.

A multicountry study led by Dr. Christian Happi, of Redeemer’s University in Nigeria, aims to improve clinical diagnostics of fever-producing illnesses, which are key causes of death and disability in rural Africa. However, the project was sidetracked by the outbreak of the Ebola epidemic and the team instead worked around the clock to help confirm cases in the region, developing new sequencing methods for the Ebola virus and clarifying humans as the main vector.

An announcement of funding opportunities for the next phase of H3Africa grants is expected in 2016.

RESOURCE

Website: <http://h3africa.org>

NIH aims to advance collaboration on chronic diseases

By Shana Potash

Noncommunicable diseases kill 38 million people a year, most of them in low- and middle-income countries (LMICs), according to the WHO. These chronic conditions—which include cancer, cardiovascular and respiratory diseases, and diabetes—threaten health as well as social and economic development. To address the growing global burden, representatives from multiple U.S. government organizations recently gathered at the NIH.

“How can we work together on global noncommunicable disease research?” asked Dr. Ted Trimble, director of the National Cancer Institute’s Center for Global Health, as he opened a two-day conference. The Center convened officials involved in research, prevention and control, capacity building and development to help synergize the government’s NCD initiatives.

The global health landscape is changing, noted Ambassador Jimmy Kolker, HHS Assistant Secretary for Global Affairs, in his keynote address. U.S. global health collaborations historically have focused on controlling infectious diseases, improving maternal and child health, and bolstering health systems. Now, there’s the challenge of chronic diseases. “The global recognition of the rising problems of NCDs, and opportunities to prevent the risk factors such as tobacco use, hypertension and obesity is a changing paradigm in global health,” Kolker said. “It’s not just about external threats that infectious diseases pose, but a global view that we live in this networked, commercialized world with health challenges that affect all of us.”

In 2011, the U.N. launched a campaign to stem the epidemic and included NCDs in the recently announced Sustainable Development Goals. Kolker said the U.S. could learn from, and share information with, other countries working to reduce NCD deaths and facing similar dilemmas regarding risk factors as well as access, cost and quality of care.

Kolker pointed out another global health shift, calling the donor-recipient relationship “very last century.” Countries are looking to the U.S. for technical partnerships to build the capacity of their scientists and service providers, he observed. “Even in the poorest countries, the question is, ‘How do you do this in the United States?’”

© 2007 Divya Pal Singh, courtesy of PhotoShare



A home-care nurse measures the blood pressure of a terminal cancer patient in Uttam Nagar, New Delhi.

The incidence of NCDs is rising faster, occurring at a younger age, and having worse outcomes in LMICs than in wealthier nations. They take an enormous economic toll. A recent Council on Foreign Relations (CFR) report named it “the emerging global health crisis.” Meanwhile, a study by the World Economic Forum and Harvard University put a dollar figure on the problem—estimating NCDs will cost developing countries about \$21.3 trillion over the next two decades.

“If you can make an economic case for investing in global health, you probably should start with NCDs in low- and middle-income countries because the overwhelming proportion of burden falls between the most productive years of life,” explained Thomas Bollyky, a CFR senior fellow, who presented highlights from the Council’s report. “Given the scale at which this is happening,” he added, “it reverberates through households, health systems and national governments, and it starts to have global effects.”

While health spending in LMICs has tripled over the last two decades, it’s still low, Bollyky said. The governments of all LMICs together, representing about 5.7 billion people, spend as much or less on health than the governments of Canada, the United Kingdom, France and Germany combined, which only serve about 300 million citizens. In LMICs, people are poorer and can’t afford to buy health care out of pocket and governments aren’t providing the preventive and chronic care higher income countries do. That, Bollyky explained, is a key driver of the problem.

Given that lifestyle choices, such as a diet and exercise, are modifiable risk factors, both Bollyky and Kolker suggested engaging the private sector to find solutions. On the research front, Trimble drew attention to a new funding opportunity to develop regional centers of research excellence focusing on noncommunicable diseases in low- and middle-income countries.

RESOURCE

Funding opportunity: <http://bit.ly/NCDCenters>

FOCUS

Brain disorders across the lifespan

Research to achieve nervous system health worldwide

NIH-led effort details global brain disorders research agenda

By Ann Puderbaugh

Infants are starved of oxygen during difficult births. Children's cognitive function is permanently damaged due to malnutrition or exposure to infections or toxins. Adults suffer from crippling depression or dementia. The breadth and complexity of these and other brain and nervous system disorders make them some of the most difficult conditions to diagnose and treat, especially in the developing world, where there are few resources. An NIH-led collaboration has studied these complex issues that occur across the lifespan and recently published a supplement to the journal *Nature* that lays out a research strategy to address them.

"We may be at a tipping point for research related to global brain disorders," according to an introductory article authored by co-editors Dr. Donald Silberberg, of the University of Pennsylvania, and Dr. Rajesh Kalaria, of Newcastle University in the United Kingdom. "Over the past few decades, exciting basic science discoveries have been made, effective interventions have been developed and advances in technology have set the stage for a research agenda that can lead to unprecedented progress in this field."

More than 40 scientists collaborated to produce nine review articles that detail research priorities for different aspects of brain disorders in low- and



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nature publishing group

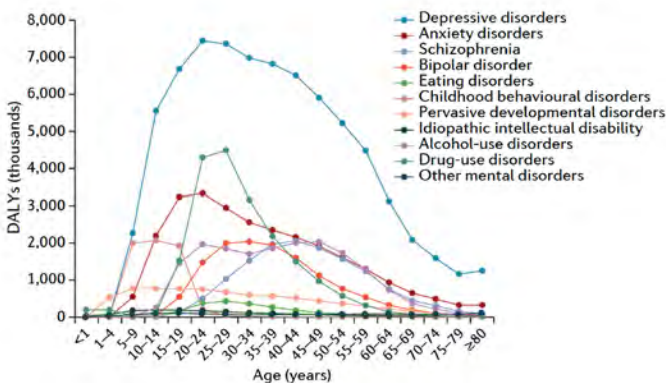
More than 40 scientists collaborated to produce a journal supplement, published by *Nature*, which details the global brain disorders research agenda.

middle-income countries (LMICs). The most strategic opportunities involve cross-disciplinary studies of the relationship among environmental, developmental and genetic factors on brain disorders, they note. Advances in genomics provide new clues for mental disorders research, including predispositions for substance abuse and addiction, which could be harnessed to improve diagnosis and identify tailored treatments. The miniaturization of diagnostic technologies and other mobile health advances could improve surveillance, assessment and treatment of mental and nervous system disorders in LMICs, where cellphones are widely used.

To address infection-related nervous system morbidity, the authors say, scientists should produce accurate estimates of disease burden, develop point-of-care assays to diagnose infections, improve tools to assess cognitive and mental health impairment, and study ways to prevent and treat infections. In addition, the authors note LMIC populations suffer exposures to toxins due to poorly regulated mining or other industries, which provide unique opportunities to advance scientific understanding of brain responses to environmental challenges.

The authors also advocate for longitudinal studies that would be conducted across the lifespan in LMICs, to study the unique circumstances and risk factors in childhood, adolescence, adulthood and old age. Regional variations in the challenges posed by brain disorders mean that research priorities need to be addressed country-by-country, and by regions within countries. To explore these

DISABILITY-ADJUSTED LIFE YEARS (DALYs) FOR EACH BRAIN DISORDER BY AGE



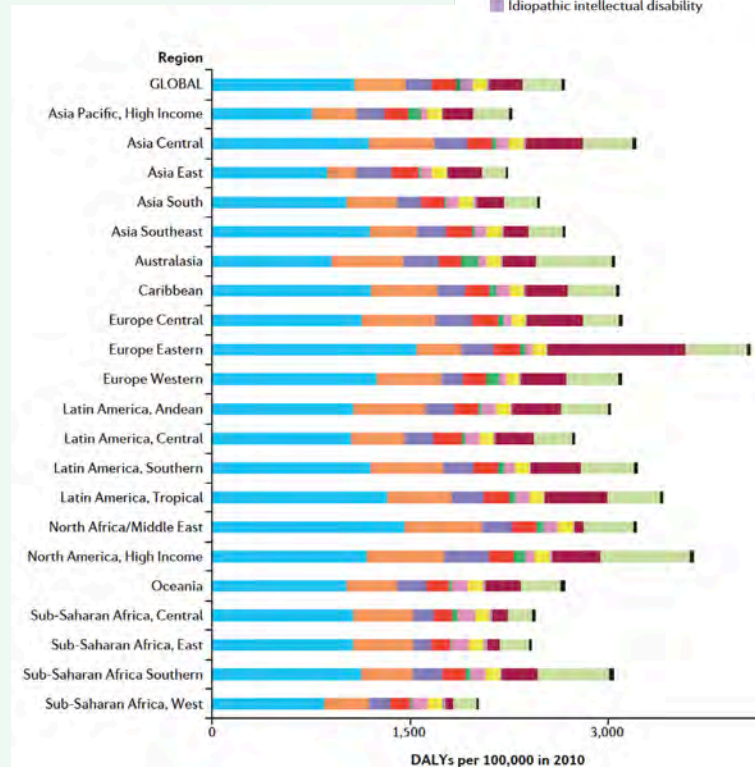
Reference: *Global Burden of Disease Study 2010*

many research gaps, local scientific capacity must be developed, as these questions are best addressed by indigenous scientists who can seek context-sensitive solutions, the authors maintain.

Although they cause nearly one-third of the global burden of disease, brain and nervous system disorders have been “largely absent” from the global health agenda, the authors report. As the population ages, these disorders will make up a growing proportion of illness and disability. This rise will be steeper in LMICs, where early life trauma, infectious diseases and malnutrition contribute to the development of these disorders, they predict. Although developing countries bear a disproportionately large share of these problems, they have minimal resources to cope with the challenges.

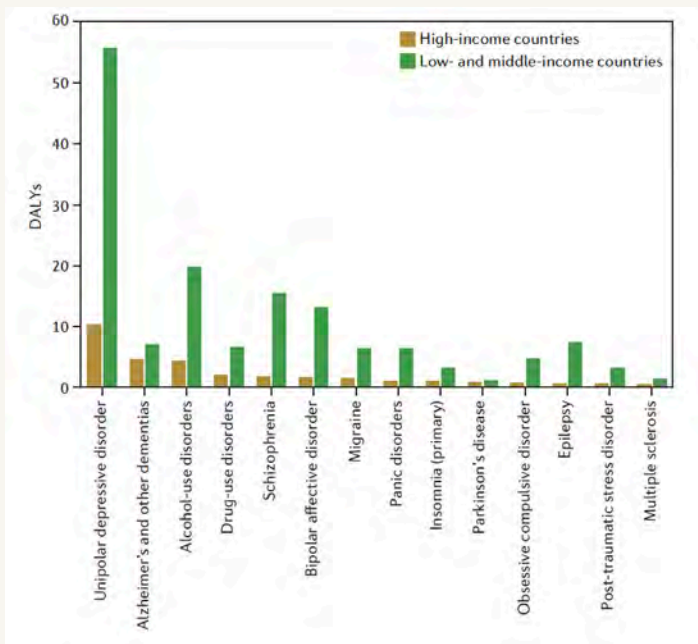
“This burden significantly affects the ability of children and adolescents to thrive and live out their true potential, and the ability of young adults to be economically productive and support their families, as well as the opportunity for older adults to age in safe and nurturing settings,” the co-authors observe.

BURDEN OF RISK ASSOCIATED WITH SPECIFIC BRAIN DISORDERS



Reference: Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010, The Lancet, November 9, 2013

COMPARISON OF DALYs



Reference: Global Burden of Disease Study 2010 and WHO http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en

The tide is starting to change, the supplement’s authors acknowledge, with mental health, substance abuse and chemical exposures among the priorities included in the new Sustainable Development Goals, announced by the U.N. last September.

The project, led by Fogarty’s Center for Global Health Studies, grew from a meeting of grantees and other scientific experts, convened in February 2014.

While advances in brain imaging, nanoscience and genetics hold much promise for research discoveries, more resources are needed, according to Fogarty Director Dr. Roger I. Glass, who contributed a foreword to the publication. “We hope this supplement inspires other scientists and funding partners to join us in addressing the full spectrum of research, training, implementation and policy questions needed to alleviate global suffering from mental and neurological disorders that occur across the lifespan.”

The journal supplement is open access and available at www.nature.com/brain-disorders.

OPINION

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

Setting sustainable global health goals



Are they ambitious? Sure! Can they be achieved? Maybe. Regardless, the new Sustainable Development Goals adopted by the U.N. in September serve as a useful reminder that, as much progress as we've made in improving health globally, there are still many in the world who suffer from curable diseases and lack access to basic health care.

Intended to build on accomplishments made under the Millennium Development Goals, the SDGs are more expansive and include noncommunicable diseases among the targets for progress by 2030. While impressive gains were made toward achieving the MDGs—in reducing child mortality, improving maternal health and combatting infectious diseases—much remains to be done.

I'm pleased to see the new objectives include the need to improve diagnosis and treatment of chronic, noncommunicable diseases (NCDs), enhance mental health, address substance abuse, and reduce injuries and deaths from traffic accidents and exposures to pollutants. They also include goals to provide clean water and sanitation—key to limiting spread of disease—as well as to take action against climate change, another troubling area with implications for health.

Here at Fogarty, we've been working with our grantees for three decades to make progress on these complex issues—through our research and training programs on NCDs, brain disorders across the lifespan, trauma and injury, and tobacco cessation. We're excited to begin a new partnership—called the GEOHealth Hubs initiative—designed to build research and training centers to study environmental and occupational health problems in developing countries. Some of the regional centers will investigate aspects of climate change, air and water pollution and other health hazards. (See pages 1-2 for more details.)

It's been said, "There is no health without mental health," so it's particularly important that this often overlooked field is included among the SDGs. Fogarty has funded projects to catalyze research in this area for more than

10 years. The toll of mental, neurological and substance use disorders is forecast to climb over the next decades, especially in developing countries, where there is little access to treatment. It's critical we redouble our efforts to learn more about the continuing and long-lasting effects of early life trauma, infectious diseases and malnutrition, and determine effective interventions to reduce suffering from these conditions.

We have just published a journal supplement in *Nature* that details the pressing research agenda for global brain disorders, an effort involving more than 50 NIH experts, grantees and collaborators, and led by Fogarty's Center for Global Health Studies. I encourage you all to review it, as there is much to be done. (See pages 8-9 for more.)

For these and other health problems, more good quality data are needed. As we encourage governments to embrace the SDGs, we will need to offer them ways to measure progress and evidence to inform their policy and funding decisions.

Yet this is a promising time, with many opportunities to make advances that improve health. By applying innovations, we can drive progress—through genomics, big data and new technologies. As we have seen, even modest investments can bring huge returns.

Finally, I'm delighted the SDGs propose to increase training and retention of the health workforce in developing countries, as well as strengthen capacity for disease surveillance and management of global health risks. That has been at the heart of Fogarty's research and training programs to strengthen scientific capacity in low- and middle-income countries. Most recently, we have helped transform medical education in sub-Saharan Africa, through the Medical Education Partnership Initiative. Meanwhile, our Fogarty Scholars and Fellows program has encouraged early-career doctors, dentists, scientists and veterinarians to pursue global health careers. These emerging global health leaders are motivated and ready to tackle the many challenges.

The SDGs' aims are aspirational and it may be a stretch to think we can support them all. But they underscore our unwavering commitment to someday achieve the ultimate goal—ensuring everyone who shares this planet has the opportunity to live a long and healthy life.



Former Fogarty grantee wins Nobel Prize

Former Fogarty grantee Dr. Angus Deaton has received the Nobel Prize for economics, based on his analysis of consumption, poverty and welfare. A professor at Princeton University, Deaton has been supported by Fogarty's global health and economic development program and currently has a National Institute on Aging grant for research in South Africa.



India loses scientist who oversaw clinical trial rules

Indian clinical pharmacologist Dr. Ranjit Roy Chaudhury, of the Institute of Medical Education and Research, has died. He played a key role in encouraging stakeholders, including the NIH, patient advocacy groups and the Indian government, to reach a consensus on new clinical trial regulations.



Gates Foundation's malaria chief dies suddenly

Dr. Alan J. Magill, director of the Bill & Melinda Gates Foundation's malaria program since 2012, has died. An internist with a subspecialty in infectious diseases, he previously held positions in the U.S. government, including with the Defense Advanced Research Projects Agency and the Navy's Medical Research Center in Peru.



NIH's mental health director Insel moves to Google

After 13 years directing NIH's National Institute of Mental Health, Dr. Thomas R. Insel has announced he will join Google Life Sciences. He will be part of a team exploring new technologies to improve mental health by providing earlier detection, better prevention and more effective management of psychosis, mood disorders and other conditions.



Rwandan health minister honored with Roux Prize

Rwandan Minister of Health, Dr. Agnes Binagwaho, has won the 2015 Roux Prize for using health data and analysis to reduce disease, injury and other health risk factors. The prize includes \$100,000 and is awarded by the University of Washington's Institute for Health Metrics and Evaluation.



Clean cookstoves expert receives US award

Jacob E. Moss has been honored by the U.S. Partnership for Public Service with its 2015 Samuel J. Heyman Service to America Medal, for bringing together agencies, countries and corporations to promote cleaner cookstoves. NIH and Fogarty are partners in the initiative. Moss is a senior advisor at the EPA, on detail to the State Department.

WHO issues new report on global aging

By 2050, nearly 1.5 billion people will be 65 or above, with the proportion of older people growing fastest in developing countries, according to the WHO's World Report on Aging and Health. The study discusses steps to enhance integrated care and maximize seniors' quality of life.

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

CDC cites lessons from Ebola outbreak

The Ebola outbreak response has provided useful lessons on how to better detect, respond to and prevent the spread of future health threats, according to a CDC report.

Full paper: <http://bit.ly/CDC-on-Ebola>

Traffic kills 1.25M yearly, most in LMICs

About 1.25 million people are killed by traffic accidents each year, 90 percent of them in low- and middle-income countries. The WHO's new global status report on road safety gives a snapshot of data around the world.

Full report: <http://bit.ly/rd-safety>

NIH launches portal for undiagnosed diseases

The NIH has produced a new online portal for patients worldwide who suffer from undiagnosed diseases and would like to apply for help. Researchers in NIH's Undiagnosed Disease Network have assessed 800 patients since 2008, producing a diagnosis for about a quarter of them.

Press release: www.genome.gov/27562471

LMICs are adding mental health policies

Low- and middle-income countries are adopting more mental health policies, with scientific evidence pointing to cost-effective interventions, according to a policy paper by the nonprofit Center for Global Development.

Full paper: <http://bit.ly/LMIC-mental>

NIH-supported diabetes database opens

A new online database allows researchers to view data on over 100,000 human genetic samples with information on Type 2 diabetes, obtained from clinical consortia supported by the NIH and the Foundation for the NIH. By facilitating access to the data, NIH's Accelerating Medicines Partnership hopes to speed research and development of new treatments.

Website: www.type2diabetesgenetics.org

Funding Opportunity Announcement	Details	Deadline
Emerging Global Leader Award (K43)	http://bit.ly/leaderK43	Dec 16, 2015
Global Brain and Nervous System Disorders Research (R21) (R01)	http://bit.ly/BrainR21 http://bit.ly/BrainR01	Jan 5, 2016 Jan 5, 2016
Household Air Pollution (HAP) Health Outcomes Trial (UM1)	http://bit.ly/HAP-2016	Jan 19, 2016
International Research Scientist Development Award (IRSDA) (K01)	http://bit.ly/IRSDA2016	Mar 2, 2016
Global Infectious Disease Research Training Program (GID) (D71) (D43)	http://bit.ly/GID-D71 http://bit.ly/GID-D43	July 29, 2016 July 29, 2016

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

Global Health Matters

November/December 2015

Volume 14, No. 6 ISSN: 1938-5935

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National Institutes of Health
Department of Health and Human Services

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Profiles in Science

NATIONAL LIBRARY OF MEDICINE

NIH makes Rep. John E. Fogarty's papers available online



The NIH's National Library of Medicine (NLM), the world's largest medical library, has made available online an extensive selection of papers from the John E. Fogarty collection at Providence College. The documents from the former Democratic Representative from Rhode Island—which include correspondence, legislative records, speeches, interviews and photographs—are featured on Fogarty's entry on the NLM's Profiles in Science website. Under his leadership as chair of the appropriations subcommittee with responsibility for research funding, the NIH budget grew from \$37 million in 1949 to \$1.24 billion in 1967.

"Congressman Fogarty's profile highlights his effective work with colleagues across the political spectrum to advance medical research and public health in the United States in the mid-20th century," said NLM Acting Director Betsy Humphreys.

During Fogarty's tenure in Congress, he repeatedly, but unsuccessfully, argued for creation of an international health research institute to promote the study of global health. His sudden death of a heart attack in 1967 provided the catalyst that led to the establishment of the John Edward Fogarty International Center at NIH the following year.

"Congressman Fogarty firmly believed that diseases know no borders and that all people deserve to live long and healthy lives. Today, these ideas are at the heart of our programs to encourage international research collaborations and support scientific training in low- and middle-income countries," said Fogarty Director Dr. Roger I. Glass.

In addition to official documents, visitors to the site can view a 2014 interview with former Rep. Melvin R. Laird, whose bipartisan collaboration with Fogarty was instrumental in passing legislation related to medical research. The interview was made possible through the generosity of Fogarty's daughter, Mary Fogarty McAndrew, and her husband, Thomas McAndrew.

► Website: <http://profiles.nlm.nih.gov/HR>