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

Africa's health, research workforce gets \$26M boost

To further strengthen the health care and research workforce in sub-Saharan Africa (SSA), Fogarty is planning to award about \$22 million over five years, through a new program funded by the President's Emergency Plan for AIDS Relief (PEPFAR). The seven projects being supported by the Health Professional Education Partnership Initiative (HEPI) are intended to leverage the achievements and lessons learned from the previous Medical and Nursing Education Partnership Initiatives (MEPI and NEPI).

A related award will provide nearly \$4 million over five years to fund the African Forum for Research and Education in Health (AFREhealth) which will serve as a leadership and convening organization to network institutions to develop and share innovations, curricula and policy.

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Photo by Richard Lord for Fogarty



A new program administered by Fogarty will provide \$22 million to improve health care workforce capacity in sub-Saharan Africa.

NIH trying to change science culture, boost women's role

The NIH is strengthening its efforts to end sexual harassment both at the agency and within the research institutions it funds. "Our goal is to create a paradigm shift in the scientific culture wherever NIH research activities take place to eliminate sexual harassment and enhance women's contributions to scientific advancements," NIH Director Dr. Francis S. Collins said in a statement.

Sexual harassment is about power, he said. "It's morally indefensible, it's unacceptable and it presents a major obstacle that is keeping women from achieving their rightful place in science."

In addition to implementing changes inside NIH, the

agency is also bolstering grant oversight procedures to address sexual harassment at NIH-funded institutions. A new website has been developed with information regarding NIH policies, terms and conditions that require NIH grantee institutions provide a harassment free-environment, relevant laws and regulations, and contacts for reporting any incidents. The URL is www.nih.gov/anti-sexual-harassment.

A recent National Academies report found no evidence that current policies and procedures have significantly reduced sexual harassment in academic sciences, engineering and medicine, Collins noted. "It is clear we must do more to change the fundamental culture of our organizations."

FOCUS



Urgent need for dementia research in LMICs

- India study sets stage for U.S. test of screening tool
- Brazilian brains focus of genomics research
- Potential dementia risk factors merit study in Africa

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Africa's health, research workforce gets \$26M boost

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“Through this new program called HEPI, we are empowering African institutions to tackle the region’s most pressing health problems, improve the effectiveness and efficiency of the U.S. response to HIV/AIDS, and reduce the suffering and death the epidemic continues to cause across the region,” said Fogarty Director Dr. Roger I. Glass.

retain qualified faculty, combat brain drain of trainees, increase the number of health professionals in neglected rural areas, and build the human and organizational resources to support research at the institutions. Finally, grantees will consult with stakeholders such as the Ministries of Health and Education to ensure national workforce needs

are being met, and form partnerships to strengthen national networks of African health education and research institutions.

The companion Association award will provide leadership for institutions across Africa, and act as a hub to support joint educational activities with a focus on outreach to broad communities and multiple stakeholders.

These may involve holding an annual symposium, establishing topical working groups, conducting mentoring activities and developing curricula.

HEPI will build on the framework developed through the prior MEPI/NEPI programs. Some key accomplishments included forming a network of more than 60 African medical schools, establishing dedicated offices for grant writing and management, upgrading rural training sites, promoting interdisciplinary education and incorporating research into academic training. In addition, new electronic educational practices were developed, broadband access was enhanced across campuses, e-learning materials were developed and shared, skills labs were established to provide



HEPI will build on progress made under the previous MEPI program, which helped Africa's medical schools move from hard copy textbooks to tablets.

training in procedures, and tablets were provided so students could access current health information. Also, a Principal Investigator council was formed to manage and coordinate activities among participants.

HEPI is administered by Fogarty and funded by PEPFAR, the U.S. response to the global HIV/AIDS epidemic. Begun 15 years ago, PEPFAR now has activities in 50 countries and supports over 14 million men, women and children on HIV treatment.

HEPI awards:

Ethiopia: Addis Ababa University

Kenya: University of Nairobi

Mozambique: Eduardo Mondlane University/Mozambique Institute for Health Education and Research

Tanzania: Muhimbili University of Health and Allied Sciences

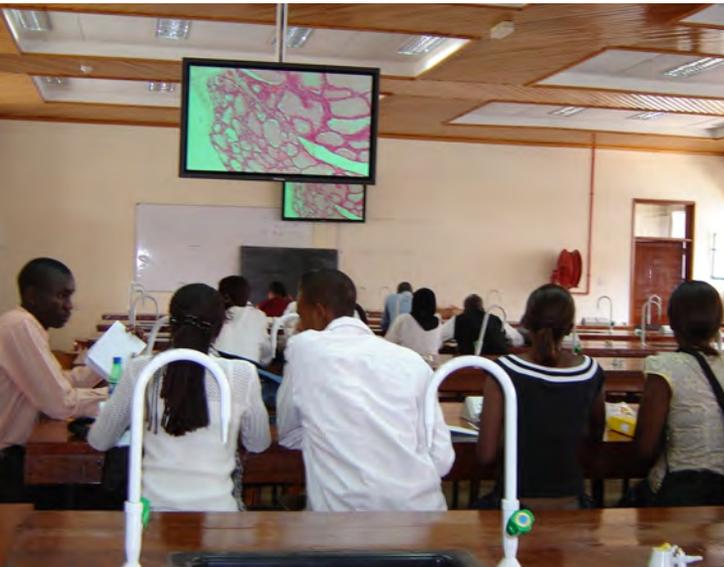
Uganda: Mbarara University of Science and Technology

Uganda: Makerere University

Zimbabwe: University of Zimbabwe

AFREhealth award:

Uganda: Makerere University



The Health Education Partnership Initiative (HEPI) will strengthen innovative training approaches, including e-learning curricula.

The overarching goal of the initiative is to encourage activities that prepare an African workforce capable of meeting the biomedical, behavioral and clinical research needs in PEPFAR-priority countries with a high burden of HIV/AIDS. Grantee institutions are being supported to expand and enhance innovative education models, evaluate and disseminate best educational practices, introduce and test novel training approaches including interprofessional education activities, and enhance opportunities for students to conduct locally relevant research as an integral part of their professional training. In addition, HEPI participants will develop strategies to recruit and

Photos courtesy of MEPI Ethiopia

Photo courtesy of Dr. James Kiarie, MEPI Kenya

RESOURCES

<http://bit.ly/AfricanHealthEd>

Research revolutionizes hydrocephalus care

By Karin Zeitvogel

A treatment pioneered and proven with Fogarty support has revolutionized care for hydrocephalus and saved money—and probably lives—in resource-poor and wealthy countries alike. Developed by Dr. Benjamin Warf after he noticed “an enormous number of babies with hydrocephalus” presenting at a Ugandan children’s neurosurgery clinic, the treatment allows doctors to avoid placing a shunt in babies to drain excess cerebrospinal fluid from the brain.

“This is important because half of shunts fail within two years of placement and all fail within five to 10 years,” said Warf. “When they fail, the child has to have emergency surgery or they’ll die from elevated intracranial pressure. But in sub-Saharan Africa and other limited-resource regions, many patients don’t have access to emergency medical systems where they can get immediate care.”

Warf himself placed shunts, the predominant treatment worldwide for hydrocephalus for several decades, in hundreds of babies with hydrocephalus during his first few years in Uganda, but in the back of his mind was the nagging thought that, while he was treating one problem, he was creating another—shunt dependence. So he set about developing a novel treatment for hydrocephalus, combining two methods that had been used individually before, with limited success. One, endoscopic third ventriculostomy (ETV), involves making an opening in one of the ventricles, or cavities, of the brain to allow fluid to drain, and the other, choroid plexus cauterization (CPC), reduces the amount of cerebrospinal fluid the brain produces.

Scientists knew that ETV-CPC is less likely to fail over the long term but didn’t reduce the size of the ventricle as much as shunt placement did, raising concerns that cognitive development would be compromised in children who had the new procedure. So, with a grant through Fogarty’s brain disorders program, largely funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), Warf and his colleagues ran a randomized controlled trial to compare outcomes after ETV-CPC and shunting in babies with post-infectious hydrocephalus.

Photo courtesy of Dr. Warf



A health care worker holds a baby with hydrocephalus at the CURE pediatric neurosurgery hospital in Uganda.

Twelve months after surgery, they assessed the neurological development of 100 infants enrolled in the study conducted at the CURE pediatric neurosurgery hospital in Mbale, Uganda. Their findings, published in the *New England Journal of Medicine*, showed that children in the shunt group had smaller ventricles a year post-operation than the ETV-CPC group, but brain growth and developmental outcomes for the two groups were the same. For the first time, research was showing that developmental outcome correlated with brain volume, not

ventricle size. “For the past 50 years, hydrocephalus treatment has been directed at making the ventricle smaller, but we found that what’s important is not ventricle size but whether the brain is growing or not,” said Warf.

The children will be followed for five years after surgery to allow Warf and his colleagues to continue to monitor and assess their development and brain growth.

Warf received a MacArthur Genius award in 2012 for developing ETV-CPC and advancing standards of, and access to, health care in both the developed and poorest regions of the world.

“ETV-CPC is an example of how helping people elsewhere also allows us to make gains for Americans,” he said. U.S. pediatric neurosurgeons have trained in the new technique in Uganda, where the large patient population allows them to perform multiple hydrocephalus operations a day. ETV-CPC has been taken up at major pediatric neurosurgery centers in North America, including Boston Children’s Hospital, where Warf has worked since he left Uganda in 2009. The number of shunts placed by pediatric neurosurgeons at Boston Children’s has been reduced by around a third, meaning fewer revisions when a shunt fails.

Estimates put the total cost in the U.S. of maintaining shunt function at between \$1 billion and \$2 billion a year, so placing fewer shunts is expected to lead to “big cost-savings and a decrease in morbidity and mortality from lifetime shunt dependence,” said Warf.

RESOURCES

<http://bit.ly/HydrocephalusCare>

PROFILE

First Fogarty ophthalmology Fellow studies rare cancer

By Karin Zeitvogel

As the first Fogarty ophthalmology Fellow, Dr. Fran Lebajo Wu spent a year in Ethiopia, researching a rare pediatric eye cancer called retinoblastoma. Six months after diagnosis, more than half of children in Ethiopia with retinoblastoma die or are lost to follow-up, while in countries like the U.S., nearly all children with the cancer survive.

Wu worked with pediatric ophthalmologist Dr. Sadik Taju Sherief at Menelik II hospital in Addis Ababa—one of few facilities in the country of 107 million that provide care for children with retinoblastoma. As Wu analyzed data Taju had gathered from his retinoblastoma patients, she tried to tease out answers to numerous questions. How long after noticing the symptoms of the cancer did it take for parents to bring their children to the hospital? What treatment did a child receive? What were the outcomes for these young patients?

Her research also led Wu to wonder why Ethiopian children presented so late with retinoblastoma, what the follow-up and referral patterns of Ethiopian doctors were, and how having a child with the disease affected parents' mental health. To answer these questions, Wu launched several studies, including one in which she asked Ethiopian ophthalmologists what resources were available to them for diagnosing and treating retinoblastoma, and what their practice and referral patterns are. That study found wide variations in how the eye cancer is treated in Ethiopia and led to a project aimed at standardizing retinoblastoma care in the Horn of Africa country. Another study led by Wu found that caregivers of children with the cancer felt stigmatized and faced financial difficulties because of their child's illness. "At least one person said they had to beg for money in the streets just to be able to get an MRI for their child," Wu said.

Wu's research also shed light on why Ethiopian children with retinoblastoma often present with advanced-stage illness. Patients in whom the cancer is detected early can be treated with laser coagulation, but advanced retinoblastoma often requires surgery to remove the eye, followed by chemotherapy. "There are



Fran Wu, M.D., MPH

Fogarty Fellow:	2017-2018
Fellowship at:	Addis Ababa University, Menelik II Hospital
U.S. organization:	Emory University
Research focus:	Retinoblastoma

kids in the U.S. whose retinoblastoma was caught early, who have 20-20 vision. I did not see many patients like that in Ethiopia," said Wu.

Interviews with Ethiopian parents found that while they often noticed the most common symptom of the cancer early—leucocoria, which is an abnormal white reflection from the retina of the eye—they either thought it wasn't abnormal and put off taking their child for treatment, or took their child to a health care provider "who did not understand that this needs referral and advanced treatment," said Wu. "That was a common story during our qualitative study—parents noticed it early but didn't get the appropriate treatment, even if they brought their child to a health care provider."

In addition to her research findings, Wu's Fogarty fellowship allowed her to lead a qualitative study and conduct research in a resource-poor country for the first time. She also helped to organize the first symposium on retinoblastoma in Ethiopia in May 2018. More meetings are being planned with the aim of "sharing how to build capacity and train more ophthalmologists and oncologists to treat this disease," said Wu.

Being a Fogarty Fellow not only allowed Wu to help improve care for retinoblastoma patients in Ethiopia but also taught her how to deal with the pitfalls and benefits of doing research in a resource-strapped country. "It confirmed for me that I want to work in global health, and that research needs to be part of what I do," she said. "Spending a year as a Fogarty Fellow in Ethiopia also gave me the vision and tools to seek or create for myself a research-focused role in a resource-poor setting and taught me how vital research is in building sustainable global health projects."

Photo courtesy of Dr. Fran Wu

VONTHANAK SAPHONN, M.D., M.SC., PH.D.

Dr. Vonthanak Saphonn earned his medical degree in Cambodia at a time when the country, still recovering from war and genocide, was hit by HIV/AIDS. After working on an HIV surveillance program in Cambodia, he trained at the University of California, Los Angeles (UCLA) from 1999-2003 under a Fogarty program, becoming the first Cambodian to earn a Ph.D. in epidemiology. Returning home, he was named head of research at the National Center for HIV/AIDS, Dermatology and STIs and in 2007 founded the School of Public Health, which he led until his appointment as rector of the University of Health Sciences.



How has Fogarty affected your career?

Fogarty completely changed my career plan. After earning my medical degree, my dream was to become a pediatrician. But then I met Professor Roger Detels of UCLA in 1997 at a regional workshop he ran in Southeast Asia and became interested in epidemiology. In Cambodia prior to 2000, public health and research were very new and anyone who needed training had to go abroad. It's a big switch from clinical practice to public health, but Fogarty allowed me to study in the U.S. and successfully make the transition.

What are some of your career milestones?

I was inspired by the UCLA/Fogarty program to return to Cambodia and nurture the next generation of researchers. So after becoming the first Cambodian to earn a Ph.D. in epidemiology through the Fogarty program at UCLA, I returned home with big ambitions: I wanted to establish a school of public health in Cambodia. With the support of my mentors at UCLA and the network they connected me with, my mission was accomplished in 2007 when Cambodia's School of Public Health was opened, offering a master's of public health and a master's of science in epidemiology. As of today, we've trained more than 200 students.

I was dean at the School of Public Health until 2011, when I was transferred to the University of Health Sciences, where the Ministry of Health named me rector in 2012.

What skills did your Fogarty training give you?

My Fogarty training equipped me with leadership, critical thinking, and team-based problem-solving skills that prepared me to meet public health challenges. I also learned how to network and was exposed to research, and through the teaching assistantships I had at UCLA, I gained experience of working in an academic setting.

How important is reciprocity to your programs?

Reciprocity is very important, regardless of whether a

country is low- or high-income. Graduate students from the U.S. who want to go into global health come to Cambodia to study the large cohorts of patient populations with HIV, TB or malaria that we have here, and learn from our successes and challenges. For Cambodians, on the other hand, studying in the U.S. expands our horizons and minds. There are now three U.S.-trained Ph.D.s working at the School of Public Health in Cambodia, two of whom trained under the Fogarty program at UCLA.

What is your proudest achievement?

Fifteen years ago, Cambodia was 'famous' for having the highest HIV prevalence in the region. We had a lot of new infections, a lot of patients and no treatment. Today, Cambodia is 'famous' among Southeast Asian countries for a different reason—we've succeeded in significantly reducing the number of new HIV cases and, in 2017, UNAIDS recognized us for achieving the 90-90-90 target. This means 90 percent of Cambodians living with HIV know their HIV status, 90 percent of infected people are on antiretroviral therapy, and 90 percent of people on therapy have viral suppression. We are the only resource-limited country in Southeast Asia and one of just a handful of countries globally to achieve that goal. I am proud that the data on new and existing cases of HIV in Cambodia that my surveillance and research teams produced and analyzed were used by policymakers to plan and develop strategies to successfully combat HIV there.

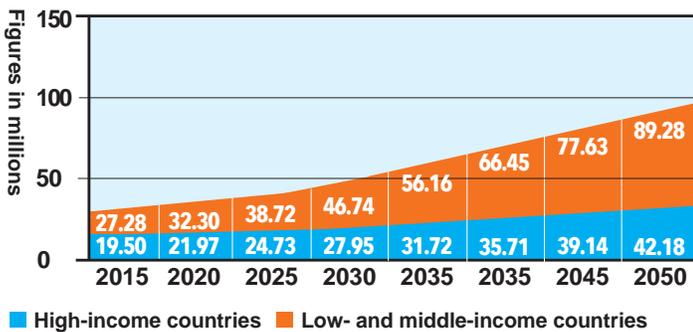
How did Cambodia reach the 90-90-90 goal?

A lot of stakeholders got involved, including the government and international partners. But without a visible, functioning public health institution, it would have been very difficult to get a commitment from the Cambodian government to be part of the fight. It's because we have such an institution and it had proven itself over the years that we were able to reach a challenging target like 90-90-90.

Tackling the growing, global burden of dementia

Every 3 seconds, somewhere in the world, there's a new case of dementia, according to Alzheimer's Disease International (ADI). One of the most burdensome conditions, dementia robs people of their memories, reasoning and independence and takes a staggering physical, emotional and financial toll on the individual, their family and society at large. Many experts are predicting a global epidemic that is expected to hit low- and middle-income countries (LMICs) particularly hard.

Global dementia is forecast to rise dramatically by 2050



Source: Alzheimer's Disease International: World Alzheimer Report 2015

Dementia is an umbrella term for several diseases that, for the most part, cause progressive changes in the brain that can affect thinking, behavior and the ability to perform even simple, everyday tasks. Alzheimer's disease, the most common form, is believed to account for 60-70 percent of all cases. Increasingly, evidence suggests a combination of genetic, lifestyle and environmental factors

Elderly women in Nigeria.



influence the risk of dementia and how it progresses. With that, scientists are moving beyond a one-size-fits-all approach and are examining the heterogeneity of disease—how Alzheimer's and related dementias differ among individuals and across groups.

Researchers throughout the world are coming together to discover new or better interventions to delay, treat or prevent dementia. And they're studying how to support the wellbeing of family members who may experience anxiety, depression and other challenges as they tend to a loved one who needs round-the-clock care.

"This is a critical time in Alzheimer's research, with new opportunities to build upon what we have learned," said Dr. Richard Hodes, director of NIH's National Institute on Aging (NIA). Equipped with increased federal funding and guided by recommendations resulting from regular stakeholder summits, NIA is leading the U.S. government's research effort to prevent and effectively treat Alzheimer's and related dementias by 2025, a goal of the National Plan to Address Alzheimer's Disease, established in 2012. "We must continue to foster creative approaches that leverage emerging scientific and technological advances, establish robust translational infrastructure for rapid and broad sharing of data and research tools, and work with funding partners and other stakeholders to cultivate and sustain an open science research ecosystem."

NIH is supporting several international research collaborations to find treatment and prevention solutions, identify risk and protective factors, and collect comparable data that would enable analysis of worldwide trends.

Also, a number of research and capacity building projects in LMICs have been supported through Fogarty's brain disorders program, with funding from across NIH. To encourage more collaboration and coordination, NIA and the Alzheimer's Association developed a database of publicly and privately funded research around the world, the International Alzheimer's Disease Research Portfolio (IADRP).

Noting that only 15 percent of World Health Organization member states have a national plan to address dementia, WHO last year produced a global action plan that calls for a doubling of the output of global research on dementia by 2025.

Resources:

<http://bit.ly/AlzDementiaResearch>

Study in India sets stage for U.S. tests of screening tool

One of the challenges of screening for cognitive impairment, especially in low-resource settings, is accounting for varying levels of literacy and education, as well as cultural differences. To meet that need, NIH grantee Dr. Joe Verghese created a picture-based memory impairment screen (PMIS) that he validated in India and also has begun testing in the U.S.

While more sophisticated studies are required to officially diagnose dementia, this tool is a useful way to flag people who are having cognitive difficulties or may be at risk of impairment, said Verghese, a professor of neurology and medicine at Albert Einstein College of Medicine. The tool uses four pictures—each from a different category, such as animal or body part. People are asked to identify the images, associate each with a category and then recall the pictures. It's a four-minute test that non-specialists can administer.

Verghese is studying the PMIS in more than 300 people in Kerala, India through a National Institute on Aging (NIA) grant, funded under Fogarty's brain disorders program. He successfully demonstrated it could discriminate those with dementia from those without. The validated tool was later tested at a dementia center with a racially and ethnically

diverse population that Verghese runs in a New York City suburb. Researchers found it proved to be a reliable test that accounted for cultural, language and educational differences.

Image courtesy Dr. Joe Verghese



An NIH-funded study in India demonstrated a picture-based memory impairment screen could discriminate people with dementia from those without.

With another NIH grant, through a collaboration between the NIA and the National Institute of Neurological Disorders and Stroke, Verghese is studying a five-minute screen—dubbed the “5-cog”—to flag people who may have cognitive impairment so they can be referred for further evaluation. The screen will include a version of the PMIS and a test measuring how fast people walk. The latter evolved from his research validating motoric cognitive risk syndrome, in which older people develop a slower gait

and complain of memory loss, signaling they may be at risk for dementia.

“The idea is that somebody else in the office gives the test and then passes the results on to the physician, the same way blood pressure and heart rate are taken by a nurse,” explained Verghese. “If we can show this works, this would be one more thing that could be done before the patient actually saw the physician.

Brazilian brains focus of Alzheimer's genomics research



NIH grantees who've been conducting post-mortem studies of brains from donors in the U.S. are conducting a large study in Brazil to understand Alzheimer's in minorities.

Photo courtesy Rush University

To better understand Alzheimer's disease and how it differs between ethnic groups, NIH-funded scientists aim to conduct post-mortem analysis of 10,000 human brains donated for research in Brazil.

The country offers an unparalleled setting for the study because

its population is a unique mixture of African, European and Native Brazilian ancestry, and because it mandates autopsies be done on anyone who dies without a known cause.

U.S. investigators are collaborating with colleagues at the University of Sao Paulo to collect the brains and conduct the research. Located in Brazil's most populous city, the university houses a center that performs more than 13,000 autopsies a year, affording scientists a large pool of potential brains for research. Investigators will identify genetic variations that cause brain damage and dementia symptoms, which will greatly increase understanding of how these conditions affect blacks and Latinos, both in Brazil and the U.S.

“The opportunity in Brazil is extraordinary. There's no other place in the world where a study of this size could be accomplished,” according to Dr. David Bennett of Rush University Medical Center in Chicago, which has an \$11.2 million grant from NIH's National Institute on Aging to lead the Study of Ancestry, Neurodegenerative Diseases and Stroke (SANDS).

As dementia rises in Africa, urgent need for research

The aging population in sub-Saharan Africa poses an “impending crisis,” with the number of people with dementia expected to surpass 7.6 million by 2050. That forecast would be a 250 percent increase from current numbers, according to Alzheimer’s Disease International (ADI).

To curtail the growing burden of dementia that’s already costing the region an estimated \$6.2 billion each year, experts say there’s an urgent need to study possible risk factors and potential interventions.

“In Africa the prevalence will be climbing unless we do something about it,” said Dr. Adesola Ogunniyi, a professor at the University of Ibadan in Nigeria, who is involved in a Fogarty-supported training program. “We need to do more studies and focus on preventive strategies and then compare risks over time and see how this will pan out.”

Ogunniyi was a co-principal investigator on a long-term NIH-funded project that compared two groups of people of African origin living in different settings—African Americans in Indianapolis, Indiana and Yoruba in Ibadan, Nigeria. The longitudinal study ran from the early 1990s to 2012 and contributed some of the earliest evidence on the prevalence, incidence and risk factors associated with dementia in sub-Saharan Africa (SSA). Its findings of a lower burden of dementia among Yoruba compared to African Americans highlighted the significance of examining interactions between genes and the environment to better understand the condition.

Numerous studies from the project are among those cited in a 2017 ADI report *Dementia in sub-Saharan Africa: Challenges and Opportunities*, which provided a snapshot of the current situation, reviewed existing evidence and suggested areas for future investigation. More research is needed in almost all areas of the dementia field, the report concluded. It noted most of the evidence is coming from countries in central and western SSA, especially Nigeria, where the few longitudinal studies of potential risk and protective factors have been conducted.

RISK FACTORS MERIT FURTHER STUDY

Age and gender

Gender and increasing age are the risk factors that have been most closely associated with dementia in SSA. Studies found women have a two- to eight-fold increased



As the population ages, countries in sub-Saharan Africa need more dementia research to help curtail what’s described as an impending crisis.

Photo by: Boniface Mwangi via Africa Knows

risk of dementia, attributed to their longevity compared to men, as noted in the ADI report.

Genetics

Carrying a form of the apolipoprotein E (APOE) gene is known to increase the risk of Alzheimer’s disease among people in the U.S., but research in sub-Saharan Africa has produced mixed results. An early study from the Indianapolis-Ibadan project found the allele was not associated with Alzheimer’s disease in elderly Yoruba, while a later study with a larger cohort found it was. Studies by researchers in two other countries found no connection. Meanwhile, a novel mutation in another gene, presenilin 1, was found to cause familial, early-onset Alzheimer’s disease in South Africa, affecting 12 people spanning four generations of the same family.

Vascular disease

In the Yoruba study, elderly participants with high blood pressure had an increased risk of dementia, compared to people with normal readings. “Hypertension has stood out to be a convincing risk factor,” said Ogunniyi, noting that was a key contribution of the Indianapolis-Ibadan project. He led a study believed to be the first to examine hypertension and dementia in Africa. The risk was most significant with a systolic BP ≥ 160 or diastolic BP ≥ 90 . High cholesterol and peripheral artery disease also have been associated with dementia in other studies in the region.

Education and literacy

While education is considered a strong mitigating factor in high-income countries—with studies supporting the “cognitive reserve” hypothesis that education may impact onset of the symptoms of dementia—results in SSA are inconclusive. Some studies have found an association between low education and dementia, others found no interaction. When an association has been found, it’s often greater for women than men.

Early Life

Childhood circumstances such as birthweight and nutrition and their potential role in dementia have not been well-researched in SSA, according to the ADI report. A study in Central Africa found an association between losing a parent in childhood and dementia, but a later investigation found none.

Lifestyle and behavior

Diet, alcohol consumption and exercise—known to affect heart and brain health—are also being studied to see if they play a role in dementia. Yoruba Nigerians, whose traditional diet of grains, vegetables and fish is low-calorie and low-fat, were found to have lower cholesterol and a lower incidence of Alzheimer's disease compared to African Americans in a study from the Indianapolis-Ibadan project. An unrelated investigation in Nigeria examined cognitive impairment after stroke and found that a pre-stroke daily diet of fish and moderate-to-heavy physical activity were protective. Findings on the relationship between alcohol and dementia are mixed.

Psychosocial

Having a weak social network has been identified as a risk factor for dementia in SSA studies. Meanwhile, other research suggests Africa's traditional communal way of living, in which people are surrounded by family and friends, may have a protective effect by keeping the brain active. "This constant stimulation, we think, keeps brain synapses functioning and can reduce cognitive decline," said Ogunniyi, who reported on the finding as part of the Indianapolis-Ibadan project. He's now on a research team studying cognitive stimulation therapy, which uses group sessions with activities to stimulate and engage people who have mild to moderate dementia.

HIV dementia

Prevalence and risk factors of HIV-associated neurocognitive disorder (HAND) are being studied in SSA, but most of the research relates to young adults. Research in high-income countries (HICs) has shown long-term use of antiretroviral therapy is increasingly resulting in cognitive impairment and dementia, which is likely to be mirrored in SSA as the population living with HIV continues to age. Data on HAND in older Africans "is a current and urgent knowledge gap," according to the ADI report.

Environment

While exposure to neurotoxins—such as copper, lead and aluminum—was not included as a possible risk factor in the ADI study, it was referenced in a Fogarty-led publication on brain disorders across the lifespan as an area that warrants more investigation. Many people living in developing countries experience significant air and water pollution, yet most of the work examining the possible relationship between cumulative exposure and onset of dementia has been done in HICs. There are unique opportunities to advance scientific understanding by conducting studies in SSA and other low-resource settings, the authors suggested. For example, many of the world's 14 million artisanal gold miners work in parts of Africa where there is little regulation and they are often exposed to high levels of mercury.

URGENT RESEARCH AGENDA

While researchers are forecasting a dramatic rise in dementia cases in SSA, public awareness and understanding of the condition in the region are low. Local languages may not even have a word for dementia and people may attribute symptoms to normal aging, or witchcraft, which could lead to stigma and discrimination.

Photo by poco_bw/Stock/Thinkstock



Women living in sub-Saharan Africa are at greater risk of dementia than men.

To help SSA countries prepare for a rise in dementia cases as the population ages, the ADI report offers suggestions for an urgent research agenda. Studies estimating the prevalence and incidence of dementia should be a top priority and, when possible, designed to monitor incidence and mortality over time. Other suggested areas for future investigation include:

- The potential effect of genetic and modifiable risk factors that would support implementing risk reduction programs, policies and campaigns.
- The impact of the HIV/AIDS epidemic on dementia, particularly among older people.
- The experience of people with dementia and their caregivers as it relates to stigma, discrimination and seeking help.

"This report provides important evidence of the huge scale of the challenge we face on multiple fronts in sub-Saharan Africa," said Alzheimer's Disease International CEO Paola Barbarino. "Not only is dementia hidden socially, but governments must do more to enhance the infrastructure needed to support those affected."

Encouraging research innovations that improve health



I find anniversaries can provide us with useful opportunities for reflection. As a diarrheal disease expert, I have recently been contemplating the impact of a research breakthrough that occurred fifty years ago—the discovery that oral rehydration therapy (ORT) could save thousands of people at risk of dying of cholera, for a treatment that cost just pennies to administer.

In 1968, a report from Bangladesh was published that described how oral rehydration solution (ORS) was used to successfully treat patients hospitalized in shock with cholera gravis, which untreated had a 40 percent mortality rate. Although research in the 1940s had demonstrated that administration of intravenous (IV) fluids was an effective approach, many cholera sufferers were located in low-resource settings where that was not available. For them, ORS was a miracle!

A few years later, at a cost of five cents each, UNICEF began producing and distributing packets of ORS that were to be added to a liter of water. Since 1968, the estimated number of childhood deaths from diarrhea has declined from about 5 million per year to about half a million.

In 1992, following years of debate about use of ORT in the U.S., the CDC recommended ORT should be the treatment of choice for all American children with diarrhea.

So what can we learn from this story of discovery that we could apply to other deadly diseases?

Sometimes the solutions are simple

Previous research had shown that sugar and salt mixed with water helped cholera patients. But it also killed some of them. The young scientists working in Bangladesh decided to measure the patients' output and use that as a basis to decide how much fluid to replace. That was the key to success.

Persistence in the face of failure

As I've learned in my rotavirus vaccine development career, setbacks are inevitable. By studying what went wrong, seeking advice from others and redoubling my efforts, I have managed to help produce some effective tools that prevent child deaths.

Necessity is the mother of invention

An American team of young physician-scientists found themselves in the unique setting of endemic cholera in the Ganges delta. People would literally die in front of them if the researchers didn't find an affordable, yet effective treatment. This wasn't a discovery made in a remote lab, it was made on the front lines of human suffering.

Optimism and fresh perspectives of youth

Established diarrheal disease experts knew ORS could be the answer but were perhaps intimidated by earlier failed clinical trials that resulted in some deaths.

Success breeds success

The 1968 article detailing the positive results was followed by a burst of research that increased the use of ORT for other diarrheal diseases and advanced new formulations that included zinc and encouraged feeding during diarrhea.

Oral rehydration therapy remains the mainstay of treatment for diarrhea worldwide for both adults and children and can be used by parents at home, as well as in clinics and hospitals.

Perhaps there are other simple treatments awaiting discovery that could prevent childhood deaths from other causes. I hope this story of success helps motivate some of today's young scientists. With the lives of so many children at stake, what better motivation can any of us have?





Colleagues, collaborators mourn Mayosi

Professor Bongani Mayosi, a noted cardiologist and dean of the Faculty of Health Sciences at the University of Cape Town, died in July. His international research collaborations include serving as principal investigator with the Human Heredity and Health in Africa (H3Africa) initiative, managed by NIH's National Human Genome Research Institute and Fogarty. Mayosi's numerous honors include election to the U.S. National Academy of Medicine.



Top U.S. science advisor nominated

Dr. Kelvin Droegemeier has been nominated to head the White House Office of Science and Technology Policy and serve as the president's top science advisor. A meteorologist with a Ph.D. in atmospheric science, Droegemeier is Oklahoma's secretary of science and technology, and has been the vice president for research at the University of Oklahoma. He's served on the National Science Board, which provides guidance to the National Science Foundation, during the two prior administrations.



NIH announces new biomedical institute director

NIH has tapped Dr. Bruce J. Tromberg to lead its National Institute of Biomedical Imaging and Bioengineering (NIBIB), where he will oversee an annual budget of \$378 million. Tromberg comes to NIH from the University of California, Irvine, where he's held dual appointments in biomedical engineering and surgery. He has been the principal investigator on multiple NIH grants, including the Laser Microbeam and Medical Program (LAMMP).



Sizemore to lead Fogarty international relations

Dr. Christine F. Sizemore is the new director of Fogarty's Division of International Relations. Sizemore, who holds a Ph.D. in bacterial genetics and microbiology, began her NIH career at the National Institute of Allergy and Infectious Diseases where she most recently led its Tuberculosis, Leprosy and other Mycobacterial Diseases Section, and contributed to the development of numerous international collaborations. Prior to joining NIH, she worked in the pharmaceutical and biotechnology industry.



Nursing institute director Grady retires

After 30 years at the NIH, National Institute of Nursing Research (NINR) Director Dr. Patricia Grady has retired. Her NIH career began at the National Institute of Neurological Disorders and Stroke where she served as deputy director and acting director, before being tapped to lead the nursing institute in 1995. Her accomplishments include developing an intramural research program that improved understanding of fatigue in cancer patients and pain associated with digestive disorders.

New report examines global quality of care

Up to 8 million deaths occur each year from poor quality of care in developing countries—more than HIV, TB and malaria combined—according to a report published by the U.S. National Academies of Sciences, Engineering and Medicine. The study calls for more implementation science research and development of interventions to improve care. Report: <http://bit.ly/NAMquality>

Study explores gaps in postdoc training

A landmark report identifies gaps in externally funded international postgraduate research training in Africa. While strengthening research capacity is recognized as a leading strategy to overcome health disparities worldwide, the study finds that support for research training is very unevenly distributed. Report: <http://bit.ly/TDRafrtraining>

Health policy and systems research studied

For health policy and systems research to remain relevant, its practitioners must re-think how health systems are conceptualized to keep up with rapid changes in how diseases are diagnosed and managed, according to a recent report published in the journal *Health Research Policy and Systems*. Report: <http://bit.ly/HPSRreport>

NIH develops resource for behavioral trials

The NIH is requesting public comment on a draft Behavioral and Social Clinical Trials Template, created to guide investigators through the systematic development of a comprehensive clinical protocol. This is an expansion of the e-Protocol Tool. Website: <http://bit.ly/NIHtemplate>

Free diabetes resource published online

A one-stop reference for medical information about diabetes has been published online by the NIH's National Institute of Diabetes and Digestive and Kidney Diseases. The publication contains prevention, treatment and other information. Website: <http://bit.ly/DiabetesNIDDK>

FDA expands incentive program

The FDA has added Lassa fever, chikungunya, rabies and cryptococcal meningitis to a program designed to encourage development of new treatments. The initiative gives companies that develop drugs for certain tropical diseases a special pass to speed up the process for a future drug application. Press release: <http://bit.ly/FDAatropical>

Funding Opportunity Announcement	Details	Deadline
Emerging Global Leader Award - Career Development (K43)	http://bit.ly/GlobalLeaderOp	Nov 7, 2018
Global Brain and Nervous System Disorders Research across the Lifespan (R21 Clinical Trial Optional) (R01 Clinical Trial Optional)	http://bit.ly/globalbrainR21 http://bit.ly/globalbrainR01	Nov 7, 2018 Nov 7, 2018
Chronic, Noncommunicable Diseases and Disorders Research Training (D43 Clinical Trial Optional)	http://bit.ly/NCDtraining	Nov 13, 2018
International Research Scientist Development Award (IRSDA) (K01) Independent Clinical Trial Required Independent Clinical Trial Not Allowed	http://bit.ly/IRSDAct http://bit.ly/IRSDAnoct	Mar 7, 2019 Mar 7, 2019
Planning for Noncommunicable Diseases and Disorders Research Training Programs in LMICs (D71)	http://bit.ly/NCDlifespan	Mar 14, 2019

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

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Fogarty trainees in Dhaka collaborate on diarrheal diseases



Fogarty Director Dr. Roger I. Glass recently visited the labs at the icddr,b in Bangladesh and reviewed the research projects being conducted by Fogarty trainees. From left: Drs. Sarwar Bhuiyan, Farhana Khanam, Yasmin Ara Begum and Glass.

During a recent visit to Dhaka, Bangladesh, Fogarty Director Dr. Roger I. Glass had an opportunity to review the scientific projects being led by Fogarty trainees at the icddr,b.

“I was most impressed by the scientists I met who are working on research projects that are best done in Bangladesh, and helping to advance our knowledge of diseases that remain real killers of children and adults in endemic and epidemic settings—typhoid, cholera and diarrheal diseases in general,” said Glass.

The researchers are working in partnership with investigators in the U.S. and elsewhere to share experiences, skills and collaborative research to improve diagnostics, vaccines and knowledge of diarrheal diseases.

RESOURCES
<https://www.icddr.org/>