

FOREWORD **OPEN**

# Brain disorders across the lifespan

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**T**he breadth and complexity of brain and other nervous-system disorders make them some of the most difficult conditions to diagnose and treat, especially in the developing world where there may only be one psychiatrist or neurologist in an entire country. These disorders occur throughout the lifespan – from infants starved of oxygen during difficult births, to children whose cognitive ability is stunted owing to malnutrition or exposure to infections or toxins, and to adults who develop depression, movement disorders or dementia. Mental health and behavioural issues are the cause of the largest burden of disability, and account for a staggering 184 million disability-adjusted life years (DALYs)<sup>1</sup>, according to the US Institute of Health Metrics and Evaluation.

That is why the Fogarty International Center (Fogarty) has been working with its National Institutes of Health (NIH) partners for more than 10 years through the *Brain Disorders in the Developing World: Research Across the Lifespan Program* to catalyse this field of research and develop badly needed expertise in low- and middle-income countries (LMICs). To mark this milestone, Fogarty felt it was important to review progress and consider how best to move forward.

In its first decade, the programme awarded about US\$84 million in more than 150 grants. Programme investigators have generated discoveries detailed in 435 peer-reviewed articles and 14 books or book chapters<sup>2</sup>. Scientists developed clinical assessment tools designed for low-resource settings, produced and tested novel interventions, and identified promising new approaches. The programme model has enabled investigators in the United States and other high-income countries to gain experience working in LMIC settings, while strengthening the research base of both US and LMIC institutions through collaborations. To help sustain this significant momentum, programme funding has supported long-term training of at least 138 LMIC scientists. Data generated by programme participants have provided crucial evidence that has been used to inform international and national practice and policy. Examples include identifying and helping to remove a global barrier to the availability of an anti-epileptic drug in Africa, increasing awareness of fetal alcohol syndrome on a national level in Russia, and convincing the Peruvian government to institute acyclovir treatment for herpes simplex virus encephalitis. Finally, the initiative has built partnerships for research between US and foreign academic institutions, and strengthened the long-term research capacity of the LMIC institutions. It has extended the frontiers of neuroscience research to include many LMIC institutions and expanded the research workforce to more rapidly address some of the world's most pressing health problems.

**Given the scientific strides that have been made by working together, it is hoped that this research and training agenda can move forward in new and exciting directions.**

The global brain programme would not have been possible without the full partnership of the other institutes at the NIH who joined forces to push forward the frontiers of brain research to include institutions and scientists in the developing world – the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the National Eye Institute, the National Institute on Aging, the National Institute on Alcohol Abuse and Alcoholism, the National Institute on Deafness and Other Communication Disorders, the National Institute on Drug Abuse, the National Institute of Environmental Health Sciences, the National Institute of Mental Health, the National Institute of Neurological Disorders and Stroke, and the Office of Dietary Supplements.

In February 2014 funding partners, grantees and brain-disorder experts convened for several days of robust discussions to explore knowledge gaps and research opportunities. These conversations, organized by Fogarty's Center for Global Health Studies, were the genesis for this series of Reviews, which it is hoped will catalyse the international community to devote attention and resources to this crucial research agenda. Fogarty owes a debt of gratitude to all the participants, authors and the editors Donald Silberberg and Rajesh Kaloria.

Given the scientific strides that have been made in imaging, diagnostics, nanoscience, novel surgical interventions and genetics, by working together, it is hoped that this research and training agenda can move forward in new and exciting directions. Although the progress made is encouraging and mental health, substance misuse and chemical exposures are included in the United Nations proposal for sustainable development goals<sup>3</sup>, much more needs to be done.

It is hoped that this supplement will inspire other scientists and funding partners to join us in addressing the full spectrum of research, training, implementation and policy questions needed to alleviate the suffering caused by global brain disorders in LMICs and other countries around the world.

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## COMPETING FINANCIAL INTERESTS

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## ADDITIONAL INFORMATION



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