

# **The Fogarty International Center's Non-Communicable Diseases & Disorders Research Training Programs**

A review of the International Clinical, Operational and Health Services Research Training Award (ICOHRTA), Millennium Promise Awards: Non-Communicable Chronic Diseases Research Training Program (NCoD) and Chronic, Noncommunicable Diseases and Disorders Across the Lifespan Research Training Program (NCD-Lifespan)

**FY2001-2017**

## Executive Summary

Effectively tackling the growing burden of noncommunicable diseases (NCDs) in low-and middle-income countries (LMICs) is an ongoing challenge. In 2018, the World Health Organization (WHO) published a report of its Independent High-Level Commission on NCDs stating the 2030 Sustainable Development pledge (SDG target 3.4) to reduce premature mortality from NCDs by one third will not be attained unless serious, accelerated change occurs at the national and international level.<sup>1</sup> Part of the challenge, as acknowledged in this report, is that countries lack the human and research capacity to address the NCD burden.

“Many countries do not have the requisite technical expertise, resources, research capacity, and data to address NCD challenges. These countries need technical support, training, implementation research, and capacity building”

*“Time to deliver: report of the WHO Independent High-level Commission on NCDs” (p. 12)*

The John E. Fogarty International Center (FIC) at the National Institutes of Health (NIH) has been supporting international collaborative research and training in NCDs since 2001. FIC’s NCD research training (D43) programs have included the 2001-2011 funded International Clinical, Operational, and Health Services Research and Training Award (ICOHRTA), the 2009-2014 funded Millennium Promise Awards: Non-communicable Chronic Diseases Research Training Program (NCoD) and the 2011 to present, Chronic, Noncommunicable Diseases and Disorders Research Training Program (NCD-Lifespan).

These three programs have helped to build NCD research capacity in LMICs by funding cutting edge science, providing short and long-term training opportunities, and supporting institutional capacity. To most effectively address the complex and diverse NCD challenges in LMICs, the NCD D43 Programs have supported training and research in a wide array of NCD topics--from mental health to cardiovascular disease to maternal child health to aging. The NCD D43 Programs have evolved in response to shifting research priorities and opportunities. The ICOHRTA Program was focused on training in clinical, operational, health services and prevention science research. In 2008, FIC recognized that ICOHRTA was not sufficiently addressing the highest priority NCDs and therefore created the NCoD Program to primarily support research and training for cancer, lung disease, diabetes, and cardiovascular disease. The current NCD-Lifespan Program was developed and launched to address lack of capacity for NCD research in LMICs across the research continuum from basic biomedical research to implementation science with a special appreciation for diseases across the lifespan, risk factors, and early developmental origins of disease.

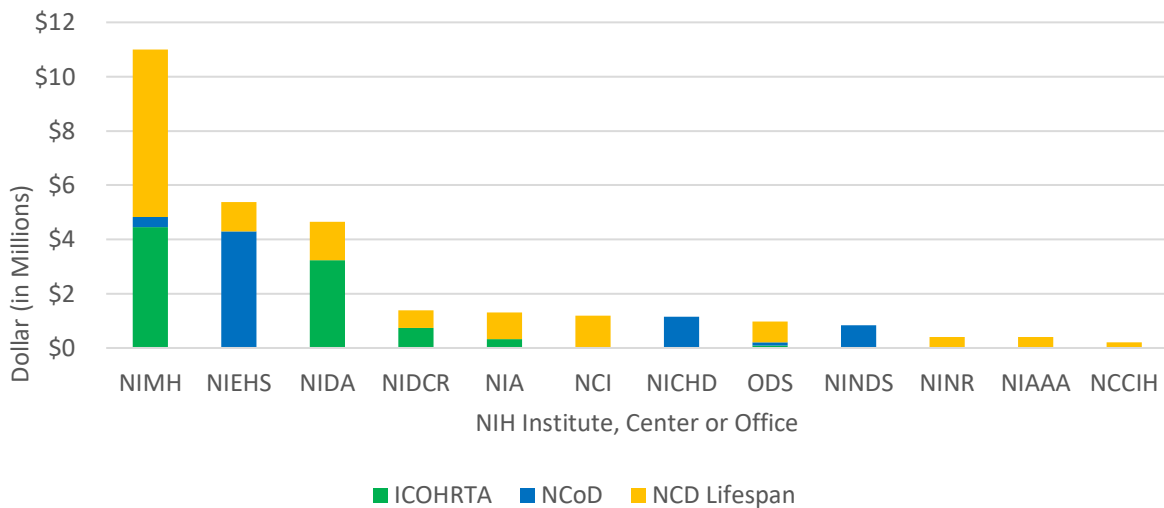
### **Awards**

Between 2001 and 2017, 79 awards were funded across the three NCD D43 Programs, an investment totaling \$79.4 million. Of that, 12 partner NIH Institutes, Centers or Offices (ICOs) contributed \$28.9M, or 36% of the NCD D43 Programs’ total costs. ICO partners include National Center for Complementary

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<sup>1</sup> WHO. Time to deliver: report of the WHO Independent High-level Commission on Noncommunicable Diseases. Geneva: World Health Organization; 2018. License: CC BY-NCSA 3.0 IGO.

and Integrative Health (NCCIH), National Cancer Institute (NCI), National Institute on Aging (NIA), National Institute on Alcohol Abuse and Alcoholism (NIAAA), *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), National Institute on Drug Abuse (NIDA), National Institute of Dental and Craniofacial Research (NIDCR), National Institute of Environmental Health Sciences (NIEHS), National Institute of Mental Health (NIMH), National Institute of Neurological Disorders and Stroke (NINDS), National Institute of Nursing Research (NINR), and Office of Dietary Supplements (ODS). Three of these ICs have administered their own awards under FIC’s NCD programs (one by NICHD, two by NIMH, and three by NIEHS). The partnership with NIMH is particularly strong; not only did they administer two awards, but they are the most significant contributor, investing over \$11M over the course of the NCD D43 Programs.



The NCD D43 Programs have research projects in 44 countries, with the most projects focused in China and India (11 awards each). In the last decade alone, direct awards to LMIC institutions have been awarded for 14 projects (9 planning awards). Uganda’s Makerere University received the most direct awards (2).



The most common research topics have been mental health (27%) and cardiovascular disease (24%). Predictably, mental health and substance abuse are prominent research areas given the contribution and involvement of NIMH.

### Research Outcomes

Although the NCD D43 Programs were focused on capacity building, they have successfully contributed to the growing empirical evidence and research related to NCDs in LMICs. From 2003 to 2017, a total of 982 publications citing a FIC NCD grant were published. The most common areas of focus for these publications were mental health (128 articles; 22%), risk factors (e.g., obesity, nutrition), and cardiovascular disease. Mental health constitutes 128 articles (22%) of the 591 articles analyzed and is the focal point of 30% (24 of the 79) of the funded NCD grants. Cardiovascular disease research is the focus for 15% of the publications and 24% of the NCD grants. In contrast, 120 publications (20%) focus on “Risk Factors,” while this topic constitutes only 15% of the funded grants.

NCD category	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Grand Total
Mental Health/Behavioral Health		1	7	4	2	12	13	10	10	15	9	20	25	128
Risk Factors						4	6	8	11	17	25	27	22	120
Cardiovascular Diseases					2		2	1	6	14	15	16	35	91
Substance Abuse/Addiction			4	3	1	5	6	7	6	13	11	8	12	76
Cancers			1				1	10	8	11	13	7	11	62
Metabolic/Gastro/Digestive/Kidney Disorders	1		2		3	1	2		1	6	11	10	18	55
HIV/STIs/Infectious Diseases			2	5	1	8	6	4	4	2	6	12	4	54
Trauma/Injury	1		2		3	3	5	4	6	7	6	5	10	52
Neurological/Developmental Disorders		1	3	3	3	2	2	2	3	6	9	5	5	44
Maternal/Child Health				1		2			1	2		2	9	17
Reproductive								2	1	2	3	1	1	10
Environmental/Occupational Health									2	1	2		2	7
Bone Diseases							1		1	2	1	1		6
Eye Diseases						1	2	1						5
Respiratory Diseases							1			2		1	1	5
Oral Health										1			1	2
Aging Disorders												1		1
Grand Total	2	2	21	16	15	38	47	49	60	101	111	116	157	735

Important research outputs other than publications were also developed with the support of the NCD D43 Programs. These outputs included clinical protocols, patient registries and medical devices. For

The program certainly made research focused on mental health policy and the development of mental health services — of public mental health — legitimate in the face of ever-growing demands [in China] to do biological research and publish in the very highest ranked journals. FIC has every reason to feel enormously proud of their contribution to the development of research linked to some of the most critical mental health problems and programs in the country.

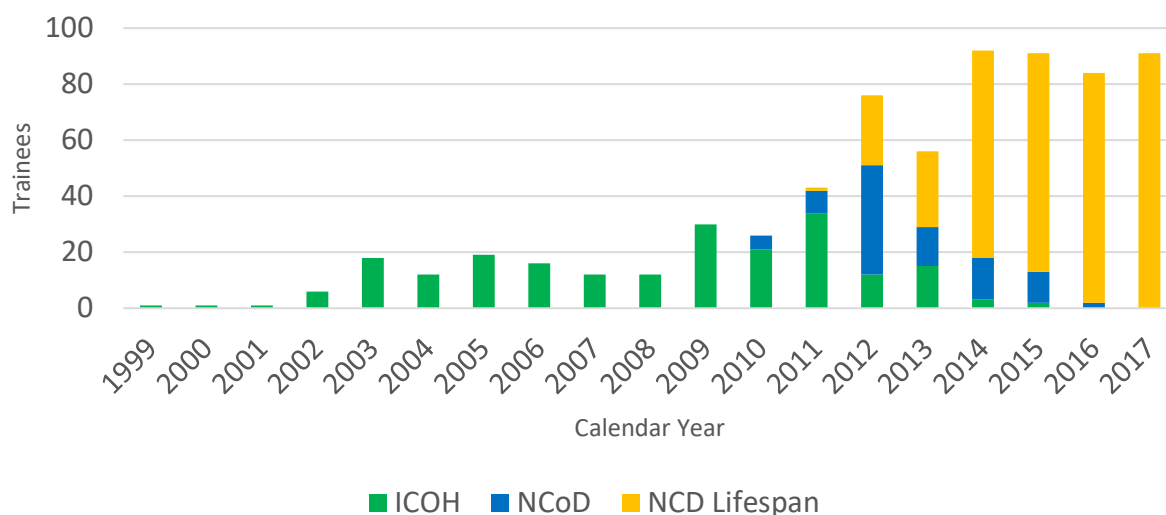
*-ICOHRTA and NCD- Lifespan grantee*

example, one grant used nanotechnology and stem cells to develop cardiac cells to repair the heart. Another project created a data analysis platform for genetic studies used to identify genotype-phenotype relations in genome-wide association studies.

### Capacity Building

The FIC NCD D43 Programs contributed to building local capacity in NCD research as indicated by the growing number of trainees graduating from the NCD D43 Programs. A total of 660 trainees who trained for a period of more than six months have been recorded. While innovative research training models are encouraged, the typical training model used in the FIC NCD D43 Programs includes a mix of

informal training and degree-related training. The majority of long-term trainees (46%) participated in non-degree programs like fellowships or certificate programs; an additional 23% of trainees enrolled in a Master’s program and 12% in a PhD program.



Grantees and trainees have also leveraged their experiences in the NCD D43 Programs to successfully secure funding for further research or research training projects. Using survey results that represent the opinions of 51 of the 71 (72%) grants from the ICOHRTA, NCoD and 2010 NCD-Lifespan Programs, 50% of projects were associated with a PI or collaborator applying for and securing additional training funding. Sixty-eight percent were successful in securing funding, usually from an LMIC source such as an institution, foundation, or government, to continue their NCD research. Trainees also demonstrated success in applying for funding post-award. Of those reporting, 78% of grants resulted in at least one trainee applying for funding; of those who applied, 77% or roughly three-quarters were successful.

The NCD D43 Programs encourage establishing and fostering partnerships between the U.S. and local researchers and institutions. Of those responding to the survey, 92% of projects agreed that the NCD D43 Programs provided sufficient opportunities to interact with other awardees and their collaborators. All survey respondents acknowledged that their network of contacts expanded due to their involvement in the program. A co-citation analysis of 1,779 articles published by alumni grantees demonstrates that sustainable research collaborations had been seeded between U.S. grantees and LMIC researchers; the majority of NCD alumni grantees (69%) have published at least three articles or more with an LMIC co-author.

### Policy and Public Health

NCD D43 Programs’ activities have informed policies and practices at a national or international level. Examples are demonstrated in five unique case studies including:

- Primary care health agents (HAs) in the Jujuy Province of Argentina have been trained through an NCD-Lifespan grant on early identification, referral and follow up of individuals with psychosis. With this proper training, the Ministry of Health was able to develop (with the help of the local co-investigators of the NCD grant) the first implementation of an early detection of psychosis plan in Jujuy.

- In 2013, the first national mental health law of China was enacted. Much of the empirical work that supported the drafting of this bill (including the controversial provision that psychiatric treatment was voluntary) was conducted by fellows on an NCD grant.
- An NCD grant has collected data and provided evidence on the highly addictive and abused opioid, Tramadol. The research has helped inform the Government of Egypt, the WHO and the United Arab Emirates about treatment protocols and has helped promote the approval of addiction medications in these countries.