

ANNUAL REPORT

NIEHS-WHO Collaborating
Centre for Environmental Health
Sciences



September 2018 – August 2019



TABLE OF CONTENTS

| | |
|--|----------|
| I. Background and Collaborating Centre Terms of Reference..... | 1 |
| II. NIEHS Leadership for the WHO Collaborating Centre..... | 3 |
| Focus Area Leaders..... | 3 |
| NIEHS Global Environmental Health Steering Committee | 4 |
| Global Environmental Health Program Staff..... | 4 |
| III. Description of Collaborating Centre Activities | 5 |
| South East Asian Regional Workshop on Children’s Environmental Health | 5 |
| Chronic Kidney Disease of Unknown Etiology Background Papers and Workshop..... | 5 |
| Educational Materials on Health Impacts of Weather and Climate Extremes..... | 6 |
| Enhancing Health System Resilience in the Americas | 7 |
| Climate Change in India..... | 7 |
| Climate Change and Human Health Literature Portal | 8 |
| Support for WHO Chemical Risk Assessment Network | 9 |
| GEH Program Support for International Workshops | 10 |

I. BACKGROUND AND COLLABORATING CENTRE TERMS OF REFERENCE

The National Institute of Environmental Health Sciences (NIEHS)-World Health Organization (WHO) Collaborating Centre for Environmental Health Sciences (the Collaborating Centre) was designated on September 14, 2013, building on several decades of productive partnership between the two institutions. NIEHS was re-designated in September 2017 and is proud to continue this important collaboration.

Directed by NIEHS Senior Advisor for Public Health John Balbus, M.D., M.P.H., the Collaborating Centre provides a focal point and resource for NIEHS to fulfill its strategic goals related to global environmental health (GEH). This partnership with WHO provides NIEHS with opportunities

for translating research findings into effective public health interventions to improve health around the world.

Under its designation for 2017-2021, the Collaborating Centre's Terms of Reference are:

- **To assist WHO in promoting international cooperation among environmental health research institutes around the world.**
- **To assist WHO in promoting global awareness of emerging issues in environmental health.**
- **To assist WHO in the preparation of training materials and support education and training efforts in environmental and occupational health sciences.**



A new Collaborating Centre workplan was initiated in September 2017 and is organized around four major focus areas corresponding to broad areas of science and international collaboration. These new focus areas incorporate the work of all previous focus areas and introduce opportunities to address new and emerging issues. By stepping back from more specific focus areas and framing our work around broader themes, the Collaborating Centre hopes to stimulate more innovative, cross-cutting activities around the world.

The **Children's Environmental Health** focus area demonstrates how NIEHS activities may involve one or more themes, since the developmental origins of health and disease (DOHaD) hypothesis is linked to causation of many noncommunicable diseases in adult life. Under this theme, NIEHS seeks to further cultivate continued leadership and expansion of an international Network of WHO Collaborating Centres for Children's Environmental Health.

Environmental Influence on Noncommunicable Diseases is a new focus area that includes NIEHS activities related to indoor and outdoor air pollution, electronic waste (both previous focus areas), and DOHaD. This area also includes new activities to explore collaboration with WHO on understanding and preventing chronic kidney disease of unknown origin (CKDu), a growing epidemic among young adults in Central America and South Asia.

The **Health Consequences of Climate and Weather Extremes** focus area builds on NIEHS' past focus area on climate change and health. NIEHS will continue to work to raise awareness of the health consequences of climate change and climate-related natural disasters, as well as the potential health benefits and harms related to activities that reduce greenhouse gas emissions, such as reducing combustion of coal for energy. The new workplan includes a focus on educational materials for health professionals and students, and further collaboration on health system resilience.

NIEHS has supported the **WHO Chemical Risk Assessment Network** for more than four years.

The new workplan formalizes network activities as a focus area. NIEHS will continue to support meetings and communications through which the Network helps build capacity for risk assessment and understanding of the health impacts of chemical exposures.



II. NIEHS LEADERSHIP FOR THE WHO COLLABORATING CENTRE

Focus Area Leaders

Focus area leaders come from different branches of NIEHS and provide guidance to each area.



*John Balbus, M.D., M.P.H.
Director of the Collaborating Centre and
lead for climate change*



*Kimberly Gray, Ph.D.
Co-lead for children's environmental
health and indoor air pollution*



*Michelle Heacock, Ph.D.
Co-lead for children's environmental
health and electronic waste*



*Bonnie Joubert, Ph.D.
Lead for chronic kidney disease
of unknown origin*



*Thaddeus Schug, Ph.D.
Co-lead for developmental origins of
health and disease*



*William Suk, Ph.D., M.P.H.
Co-lead for children's environmental
health and electronic waste*



*Claudia Thompson, Ph.D.
Co-lead for developmental origins of
health and disease and indoor air pollution*



*Brittany Trottier, M.P.H.
Co-lead for electronic waste*



*Christopher Weis, Ph.D.
Lead for the WHO Chemical Risk
Assessment Network*

NIEHS Global Environmental Health Steering Committee



*Gwen Collman, Ph.D.
Division of Extramural
Research and Training*



*Stephanie London, M.D., Dr.P.H.
Division of
Intramural Research*



*Mary Wolfe, Ph.D.
National Toxicology Program*



*Kimberly Thigpen Tart, J.D., M.P.H.
Office of the Director*

Global Environmental Health Program Staff



From left to right: John Balbus, M.D., M.P.H.; Ty Lawson, M.S.; and Trisha Castranio

III. DESCRIPTION OF COLLABORATING CENTRE ACTIVITIES

South East Asian Regional Workshop on Children's Environmental Health

In May 2019, NIEHS collaborated with the WHOCC at Chulabhorn Research Institute in Bangkok, WHO South-East Asia Regional Office (SEARO), and the UNICEF East Asia and Pacific Regional Office (EAPRO) to organize the Asia-Pacific Regional Meeting on Children's Environmental Health (CEH). At the meeting, participants discussed cross-cutting issues and commonalities among countries and regions, including lessons learned. Participants explored policy-relevant research collaborations and reviewed availability of educational tools to help translate research findings into tangible outputs. This regional meeting facilitated networking of scientists, researchers, policy makers, and practitioners in the Asia-Pacific region and increased awareness of the environmental threats to children's health, with the ultimate goal of improving children's environmental health regionally and globally. A special edition in *Reviews in Environmental Health* is currently in the development on the meeting and should be published in December 2019.

A 2019 publication resulting from the 2017 CEH meeting, *Children's Environmental Health in South and Southeast Asia: Networking for Better Child Health Outcomes* highlighted outcomes of the South Asian Children's Environmental Health Workshop, held Nov. 12-13, 2017, in New Delhi, India, hosted by NIEHS.

Chronic Kidney Disease of Unknown Etiology Background Papers and Workshop

This workshop expanded on the efforts of previous international workshops on Mesoamerican nephropathy organized by CENCAM, a 2016 workshop on chronic kidney disease in Sri Lanka, and a 2018 workshop and publication on Chronic Kidney Diseases in Agricultural Communities organized by the NIH, including international experts working in known and potentially emerging regions affected by CKDu.

NIEHS assisted the planning of and provided financial support to the *Third International Workshop on Chronic Kidney Diseases of Uncertain/Non-traditional Etiology in Mesoamerica and Other Regions* held March 20-22, 2019, in San José, Costa Rica. This workshop focused on identifying critical research gaps and building collaborations to find solutions for chronic kidney disease of unknown etiology (CKDu). Bringing together experts from a range of disciplines and geographic areas, the workshop displayed collaboration across the National Institutes of Health (NIH) including National Institute of Environmental Health Sciences (NIEHS) and National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), World

Workshop Organizing Committee Members pose for a group photo before the March 2019 Third International Workshop on Chronic Kidney Diseases of Uncertain/Non-traditional Etiology in Mesoamerica and Other Regions. (Photo courtesy of Daylin Anchía, Universidad Nacional Costa Rica)



Health Organization Regional Offices including Pan American Health Organization (PAHO) and WHO South-East Asia Regional Office (SEARO), and the Consortium for the Epidemic of Nephropathy in Central America and Mexico (CENCAM). *NIEHS contributed to the summary of the three-day gathering, which is available on their website.*

More than 135 participants from 15 countries representing academia, government agencies, and industry convened in San Jose to discuss clinical aspects and burden of the disease of CKDu. Additionally, the experts examined the biological mechanisms behind the clinical symptoms, the factors that contribute to kidney diseases, and the associated societal response to treatment.

The workshop featured breakout sessions for the eight working group focus areas. The working groups tackled different areas related to CKDu including: the combined effect of heat, dehydration, and work load; analytical epidemiology; biomarkers of renal function; surveillance and screening; clinical presentation and treatment; pathology; molecular approaches to CKDu; and assessing environmental exposures such as pesticides, agricultural chemicals, and metals.

Educational Materials on Health Impacts of Climate Change

In 2018, NIEHS created five different versions of educational materials on climate and health: 1) International High School Students; 2) US Clinical Health Care Students; 3) US Public Health Students; 4) International Clinical and Public Health Students; 5) A module focused on vector-borne diseases that is designed to accompany the Global Learning and Observations to Benefit the Environment (GLOBE) program's mosquito habitat mapper activities. The International materials refer heavily to Intergovernmental Panel on Climate Change (IPCC) and WHO references, including the WHO country profiles.

The materials have been reviewed by relevant experts and were released in December 2018. Materials can be found at <https://www.niehs.nih.gov/lessonsinclimatechange>



Enhancing Health System Resilience in the Americas

John Balbus served as deputy chair of the oversight committee for the Caribbean Public Health Agency (CARPHA) 2017-2018 State of Public Health Report. The committee met three times from September 2018 to September 2019 to finalize the report and plan for its release and subsequent communication strategy. Recommendations for action from the committee were incorporated into a series of articles for the G7 and G20 Summits by CARPHA Executive Director James Hospedales.

In addition, NIEHS has helped lead a U.S. interagency group to devise a climate and health forecast bulletin similar to the Caribbean Health-Climatic Bulletin developed in part by PAHO. PAHO's Sally Edwards has been consulted in an ongoing collaboration on seasonal to sub-seasonal climate health forecasting.

Climate Change in India

NIEHS participated in a workshop in October 2018 in New Delhi, India, on data resources and tools for climate and health. NIEHS also sponsored the Management Development Program on Climate Resilient Health Systems, hosted in August 2018 in New Delhi by the International Institute of Health Management Research (IIHMR). The meeting was created for professionals involved in direct or indirect planning and implementation of health programs, including those from academic institutions, policymakers, health planners, and practitioners working with government, international organizations, and civil society organizations. The meeting aimed to build leadership and management capacity for professionals working in the health sector in order to develop and implement climate resilient health systems.

NIEHS continues to fund and support the Understanding Climate and Health Associations in India (UCHAI) initiative. UCHAI endeavors to bring academicians, researchers, practitioners, and students from diverse fields – including climate science, environment, public health, public policy, social development, and urban planning – together

COVID-19 is an emerging, rapidly evolving situation.

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Climate Change and Human Health Literature Portal

An integrated, curated bibliographic database of global peer-reviewed research and gray literature on the science of climate impacts on human health.

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through a resource network and community of practice. During 2019, the role of Chair of the UCHAI Advisory Committee transferred from Sanjiv Kumar, M.D., to Anand Krishnan, M.D. NIEHS worked with the UCHAI Secretariat and the UCHAI Chair and Advisory committee throughout the year to organize events, webinars, and meetings. This included:

- A [Workshop on Climate and Health](#), held October 23-24, 2018
- Video on [A Climate Antidote: Building Climate Resilience in Public Health](#)
- Infographic on [How Climate Change Impacts Health](#)
- Session on 'Climate Services in India- Moving the Needle' at the 2019 World Conference on Sustainable Development
- Began developing an app to predict reported cases of Malaria
- Continued updating UCHAI.net webpage to better address interests of diverse stakeholders

Climate Change and Human Health Literature Portal

In 2018 and 2019, NIEHS continued updating and further developing the Climate Change and Human Health Literature Portal. The portal is a knowledge management tool for individuals who want to find the most relevant scientific literature on the health implications of climate change. It provides access to a database of studies published between 2007 and 2019. The project grew from NIEHS' efforts to support the U.S. Global Change Research Program's Third National Climate Assessment (NCA) through development of a health sector bibliography as a technical input for the health chapter of the NCA. This portal is an effort to make that database accessible to a global audience and in an updated form on an ongoing basis.

<https://tools.niehs.nih.gov/cchhl/index.cfm>



Support for WHO Chemical Risk Assessment Network

NIEHS Toxicology Liaison Christopher Weis, Ph.D., D.A.B.T., serves as the NIEHS lead for the WHO Chemical Risk Assessment Network, an activity under the NIEHS/WHO Collaborating Center. NIEHS supports the Network Secretariat through strategic planning, participation in steering committee and working group meetings, document reviews, and by providing administrative support for the Network. NIEHS assists WHO develop quarterly Network newsletters, website content, and other communications products.

NIEHS supported the WHO Chemicals and Health Network meeting in November 2018 in Geneva, Switzerland, and the Workshop on Emerging Risks on February. 20-21, 2019 in Bilthoven, Netherlands.

Weis provided leadership advice for both meetings and NIEHS provided administrative and record keeping support. NIEHS will host the WHO Chemical Risk Assessment Network Meeting on June 8-12, 2020, at the NIH Campus in Bethesda, Maryland. Planning for the meeting is underway.

NIEHS and NTP staff are active participants in the Systematic Review, Emerging Risks, and Capacity Building Network Working groups as well as the 2020 Meeting Coordinating committee.



Kaustub Bandyopadhyay, PRIA; Edith Parker, University of Iowa; Rajesh Tandon, PRIA; Gwen Collman, NIEHS; Nicole Novack, University of Iowa; and Bono Sen, PRIA, pose for a photo before the event (Photo courtesy of PRIA)

GEH Program Support for International Workshops

Advancing Environmental Health Research through CBPR in India

U.S. and Indian researchers and Indian public health practitioners gathered for a workshop on Feb. 26-28 in New Delhi, India, to share best methods and practices for community-based participatory research (CBPR). The workshop, “Advancing Environmental Health Research through CBPR in India,” addressed three key needs identified by Indian participants: health impacts of pesticide exposures, natural disasters and their environmental consequences, and ambient and household air pollution.

Gwen Collman, Ph.D., director of the NIEHS Division of Extramural Research and Training and a co-organizer of the workshop, led a delegation of seven American researchers to share U.S. case studies related to the three focus areas alongside their Indian counterparts who presented case studies from India. Through the presentations, panel discussions, and hands-on activities, participants

laid the groundwork for building capacity and Indo-U.S. collaborations to engage communities in research that reduces health impacts across all areas of environmental health research. In all, 19 Indian academics and researchers and 22 Indian practitioners shared the details of methodologies and best practices for conducting CBPR with the U.S. researchers.

International Conference on One Medicine One Science

NIEHS staff participated in the 4th International Conference on One Medicine One Science (iCOMOS 2019) on Feb. 11-14, 2019, in Chiang Mai, Thailand. The conference, partially supported by the NIEHS WHOCC, brought together nearly 400 experts and students from 35 countries to explore One Health solutions to a range of global environmental health problems, such as chemical exposures in pesticides, air pollution, and extreme weather events.

As part of the event, NIEHS Health Science Policy Analyst Kimberly Thigpen Tart, J.D., M.P.H., and NIEHS Senior Medical Advisor Aubrey Miller, M.D.,



organized and conducted a session on the Disaster Research Response (DR2) program, which demonstrated a One Health approach to investigating disaster-related exposures to inform response, recovery, and preparedness. The session included five case studies of disaster scenarios and resulting health issues endemic to Thailand coupled with relevant DR2 tools and resources that might be applied to each scenario. Thigpen and Miller led a discussion of disaster research needs, priorities, and opportunities in Southeast Asia following their presentation.

Miller presented the *goals of the DR2 program* and shared lessons learned during the development of DR2 and its the expansion of the DR2 model to other countries, including Japan and Canada. He stated that multi-stakeholder collaboration is not only possible but is critically important to successful disaster response. Miller emphasized the importance of leveraging prior work and relationships for new studies.



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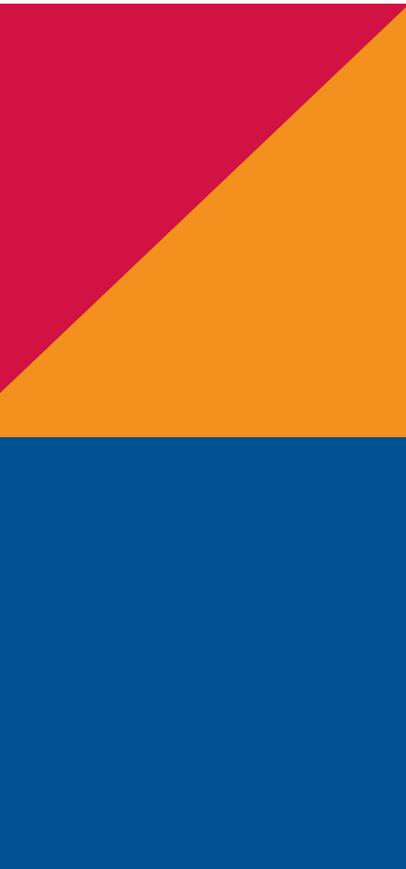
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