

ANNUAL REPORT | SEPTEMBER 2019 – AUGUST 2020

NIEHS-WHO Collaborating Centre for Environmental Health Sciences



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BACKGROUND AND COLLABORATING CENTRE TERMS OF REFERENCE

The World Health Organization (WHO) designated the National Institute of Environmental Health Sciences (NIEHS) a Collaborating Centre for Environmental Health Sciences (the Collaborating Centre) on September 14, 2013. The Collaborating Centre was re-designated in September 2017, proudly continuing a productive partnership between the two institutions.

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 the opportunities to translate research findings into effective public

health interventions that can 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**

The 2017-2021 Collaborating Centre workplan is organized around four focus areas that correspond to broad areas of science and international collaboration. These focus areas include previous focus areas and introduce new opportunities to address emerging issues. By stepping back from more specific focus areas and framing our work around broader themes, the Collaborating Centre has stimulated more innovative, cross-cutting activities around the world.

The **Children's Environmental Health** focus area demonstrates how NIEHS activities cover one or more themes. For example, the developmental origins of health and disease (DOHaD) hypothesis is linked to the causation of many noncommunicable diseases in adult life. NIEHS seeks to further cultivate leadership by expanding an international network of WHO Collaborating Centres for Children's Environmental Health.

The **Environmental Influence on Noncommunicable Diseases** focus area combines previous focus areas, indoor and outdoor air pollution and electronic waste, and includes NIEHS activities related to 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' 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 five years. NIEHS formalized Network activities as a focus area in the 2017-2021 Collaborating Centre workplan. NIEHS supports meetings that amplify the Network's goal to build capacity for risk assessment and understanding of health impacts of chemical exposures.

NIEHS LEADERSHIP FOR THE WHO COLLABORATING CENTRE

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



*John Balbus, M.D., M.P.H.
Collaborating Centre director 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.
Representative to the WHO Chemical Risk
Assessment Network*

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*

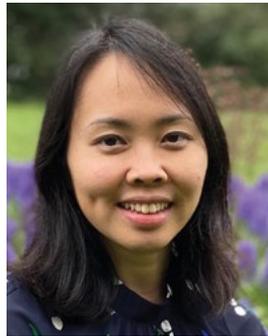
GEH Program Staff



*John Balbus, M.D., M.P.H.
Senior Advisor for Public
Health, Director of the Global
Environmental Health Program,
and Director of the NIEHS-
WHO Collaborating Centre for
Environmental Health Sciences*



*Trisha Castranio
Program Manager*



*Ann Liu, Ph.D., M.P.H.
Senior Scientist, Contractor*



CHILDREN'S ENVIRONMENTAL HEALTH

Within the CEH focus area, NIEHS focused this year on planning the “International Workshop on Children’s Environmental Health – Fundamental and Translational Research to Reduce the Burden of Disease.” The workshop was initially scheduled for July 9-11, 2020, at the Chulabhorn Research Institute (CRI) in Bangkok, Thailand. NIEHS committed funds to the event and worked with CRI to build the agenda; however, due to the COVID-19 pandemic, the event was postponed. NIEHS is actively working with CRI to deliver the workshop virtually at a future date in 2021.

NIEHS continues to support a network of WHO Collaborating Centres for Children’s Environmental Health. NIEHS facilitates regular information-sharing calls among Collaborating Centres and hosts the network’s [website](#). In early 2020, NIEHS and network participants collaborated to guest edit and publish a special issue of “Reviews on Environmental Health: Children’s Environmental Health in the Asia-Pacific Region.” NIEHS staff authored a commentary titled, “*Challenges in children’s environmental health in the Asia-Pacific region*” and a review on “*Common issues related to children’s environmental health in the Asia-Pacific region.*”



ENVIRONMENTAL INFLUENCE ON NONCOMMUNICABLE DISEASES

NIEHS annually supports a number of global activities exploring a wide variety of environmental influences on noncommunicable diseases. This includes support for the Household Air Pollution Intervention Network (HAPIN), the Chronic, Non-Communicable Diseases and Disorders Across the Lifespan program, and Dissemination and Implementation Research funding opportunities. New efforts over the year around Chronic Kidney Disease are highlighted below.

Chronic Kidney Disease of Unknown Etiology

NIEHS provided financial support, and staff assisted in the planning of the “*Third International Workshop on Chronic Kidney Diseases of Uncertain/Non-traditional Etiology in Mesoamerica and Other Regions*” held in March 2019 in San José, Costa Rica. In 2020, NIEHS published the *full conference report*.

In 2020, NIEHS and the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) issued a notice of intent to support

the development of and fund the Chronic Kidney Diseases of Uncertain Etiology (CKDu) in Agricultural Communities (CURE) Research Consortium. NIEHS and NIDDK have committed up to \$4,000,000 to support three funding opportunities that will make up the Consortium.

The Consortium will consist of a Scientific Data Coordinating Center and Field Epidemiology Sites, a Renal Science Core, and the Human Health Exposure Analysis Resource (HHEAR). The Consortium will work together to finalize ethical epidemiology research designs, execute common strategies for biological sampling and environmental assessment, apply the best analytic strategies for collected samples and data, and disseminate results to the global research and public health communities. The Consortium is also intended to serve as a resource for ancillary studies testing hypotheses pertaining to the development, progression, prevention, and treatment of CKDu.



CLIMATE CHANGE AND HUMAN HEALTH

Understanding Climate Change and Health Associations in India

NIEHS continues to fund and support the Understanding Climate and Health Associations in India (UCHAI) initiative. UCHAI endeavors to bring academics researchers, practitioners, and students from diverse fields – including climate science, environment, public health, public policy, social development, and urban planning – together through a resource network and community of practice. UCHAI is led by an Advisory Committee of esteemed experts and a Secretariat, currently housed at The Energy Resource Institute (TERI) in New Delhi. NIEHS sits on the UCHAI Advisory Committee and worked with the UCHAI Secretariat throughout the year to organize events, webinars, and meetings. Chairmanship of the advisory committee passed from Sanjiv Kumar, M.D., to Anand Krishnan, M.D., Ph.D., in 2019.

New UCHAI Advisory Committee Chairman

Krishnan, presented UCHAI's work on an NIEHS webinar in September 2019. The “*Cross-Cultural Perspectives on Urban Sustainability and Health: Smart Solutions for Smart Cities in India*” webinar, moderated by NIEHS-WHO Collaborating Centre Director John Balbus, M.D., M.P.H., also featured esteemed speakers Nitish Dogra, M.D., M.P.H., from the International Institute of Health Management Research, and Paul Wilkinson, MFPHM, FRCP, from the London School of Hygiene and Tropical Medicine.

NIEHS National Institute of Environmental Health Sciences
Your Environment. Your Health.

Today's Agenda

- **Welcome**
 - Trisha Castranio, Program Manager, NIEHS Global Environmental Health Program
 - John Balbus, M.D., M.P.H., Director, NIEHS-WHO Collaborating Center for Environmental Health Sciences and NIEHS Global Environmental Health Program
- **Making Delhi Healthier- Insights from the SHUE Database**
 - Paul Wilkinson, MFPHM, FRCP, London School of Hygiene and Tropical Medicine
- **Mass Rapid Transportation Systems (MRTS): Sustainable Solutions for Sustainable Health in India**
 - Dr. Nitish Dogra, Associate Professor and Convenor, Center for Climate, Environment and Health, International Institute of Health Management Research, New Delhi
- **The Science and Politics of Promoting Physical Activity in Urban Spaces**
 - Anand Krishnan, M.D., Ph.D., All India Institute of Medical Sciences, New Delhi

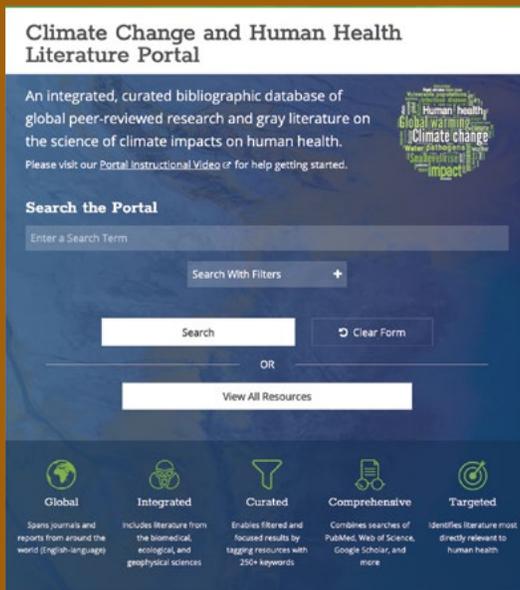
A major effort of UCHAI and the Secretariat over the year was to create a vulnerability assessment tool that generates a vulnerability index for health in districts of India. A *prototype digital tool* has been developed for state health departments to upload data, which is used to generate the Vulnerability Index. The Vulnerability Index includes three major components: Sensitivity measures, exposure measures, and adaptive capacity measures.

In Spring 2020, the NIEHS Global Environmental Health Program, which houses the Collaborating Centre, launched the Climate, Environment, and Health Seminar Series. The virtual seminar series aims to educate the NIEHS community about the impact climate change has on health. International climate change experts facilitate discussions on global environmental health research and research-based actions to prevent the consequences of climate change.

U.S. Based Climate Activities



- August 12, 2020 – *Starting and Scaling Effective Climate Change Conversations: Why Health Matters*, featuring Edward Maibach, Ph.D., George Mason University
- June 10, 2020 – *Understanding Global Climate Change and How It Affects Air Quality and Human Health*, featuring Jason West, Ph.D., University of North Carolina (UNC) Gillings School of Global Public Health
- May 6, 2020 – *How Climate Changes Health and Why You Should Care*, featuring John Balbus, M.D., M.P.H., NIEHS



The *NIEHS Climate Change and Human Health Literature Portal* is a knowledge management tool launched in 2014 for individuals who want to find the most relevant scientific literature on the health implications of climate change. The portal includes references and searchable fields for studies about the health impacts associated with exposures to climate variability and climate change, as well as literature on the health impacts of weather-related natural disasters. During the past year, NIEHS added publications released through 2019, and updated a new search and display feature. NIEHS re-launched the portal, which currently stores more than 12,000 references, on GEH Day 2020.



Global Environmental Health Day 2020

Global Environmental Health Day 2020, an annual awareness campaign and part of the Climate, Environment, and Health Seminar Series, introduced the theme, “Science at the Cutting Edge of Global Environmental Change and Health.” NIEHS Director Rick Woychik, Ph.D., and GEH program staff welcomed attendees of the first virtual and fifth annual event. The morning session featured a keynote presentation by Howard Frumkin, M.D., Dr.P.H., Professor Emeritus of Environmental and Occupational Health Sciences, University of Washington School of Public Health. Then, a panel discussion on “Health Threats and Opportunities Related to Climate Change” featured Michelle Bell, Ph.D., Mary E. Pinchot Professor of Environmental Health, Yale Schools of Forestry and Environmental Studies and of Public Health, and Lindsey Smith Taillie, Ph.D., and Christina Chauvenet of the UNC-Chapel Hill Gillings School of Global Public Health.

The afternoon session featured a keynote presentation by Kris Ebi, Ph.D., Professor of Global Health and Environmental and Occupational Health Sciences, University of Washington Center for Health and the Global Environment. The day concluded with a panel discussion on “Increasing Heat on Land and Sea: How to Protect Public Health,” featuring Anwar Huq, Ph.D., Maryland Pathogen Institute, University of Maryland School of Public Health, and Julia Gohlke, Ph.D., Department of Population Health Sciences, Virginia Polytechnic Institute and State University.

Working with NOAA Climate and Weather Data: Opportunities to enhance infectious disease modeling and pandemic preparedness

MONDAY, AUGUST 3 12:30–1:30 PM EDT

PRESENTERS

- Stan Benjamin
- Juli Trtanj

NOAA Disease Program Office

MODERATOR

- John Balbus, M.D.

NIEHS Global Environmental Health Program

CONTACT

If you have any questions or need reasonable accommodations to participate in this event, contact Ms. Yreka Castro at Yreka.Castro@niehs.nih.gov or 864-297-3345 and/or the Federal Relay at 1-800-877-8339.

SESSION SUMMARY

NOAA's mission is to understand, predict, and share knowledge of the Earth system (including atmosphere and ocean) to achieve our vision of healthy societies and ecosystems that are resilient in the face of sudden or prolonged change. NOAA seeks to achieve this mission with a One Health orientation, studying and anticipating changes to our Earth system and linkages with our ecosystems and human and animal health. In this presentation, NOAA scientists will provide an overview of our environmental intelligence capabilities relevant for infectious disease modeling: climate data, observing systems, and short- and long-term predictions. A discussion will follow between the health community and NOAA scientists about our capabilities and possibilities for improved use of environmental data for infectious disease modeling, as well as further collaboration opportunities.

REGISTRATION

Please register for the event at: <https://nih.webex.com/nih/joinstage/s.php?MTM=ea4f572af2a626216c138926261543d1>

HOSTED BY

NIEHS Global Environmental Health Program in partnership with the National Cancer Institute, National Oceanic and Atmospheric Administration and the Models of Infectious Disease Agent Study

NIH National Institute of Environmental Health Sciences

NOAA

MIDAS

NIEHS partnered with the Models of Infectious Disease Agent Study (MIDAS) Network, National Institute of General Medical Sciences, and the National Oceanic and Atmospheric Administration (NOAA) in hosting, “*Working with NOAA Climate and Weather Data: Opportunities to enhance infectious disease modeling and pandemic preparedness,*” as part of an effort to introduce weather and climate data to health scientists. Stan Benjamin, Ph.D., NOAA Global Systems Lab, and Juli Trtanj, M.S., NOAA Climate Program Office, provided an overview of NOAA environmental intelligence capabilities relevant for infectious disease modeling. This included climate data, observing systems, and short- and long-term predictions. This webinar, moderated by John Balbus, M.D., M.P.H., NIEHS, aimed to generate a discussion between the health research community and NOAA scientists regarding the possibilities for improved uses of environmental data for infectious disease modeling, as well as further collaboration opportunities.



The WHO Chemical Risk Assessment Network Systematic Review Working Group members pose for a photo during their October meeting.

SUPPORT FOR THE WHO CHEMICAL RISK ASSESSMENT NETWORK

NIEHS has been a long-time participant and supporter of the WHO Chemical Risk Assessment Network. NIEHS staff member Chris Weis, Ph.D., serves as the NIEHS liaison to the Network. Weis works alongside National Toxicology Program (NTP) experts in multiple Network working groups. NIEHS supports the Network Secretariat by participating in steering committee calls, reviewing documents, and providing administrative and meeting support. NIEHS also assists WHO with the development of quarterly Network newsletters, website content, and other communications products.

NIEHS and NTP staff members co-lead the Networks' Systematic Review Working Group (SR WG). NIEHS hosted SR WG members and a representative of the Secretariat in Durham, North Carolina, in October 2019 to help advance the group's working document.

In addition, NIEHS is an active participant in other Network working groups focused on:

- Emerging Contaminants and Risks (led by Public Health England and RIVM)
- Capacity Building (led by the Karolinska Institute and WHO)
- Coordination between WHO Risk Assessment Network and INTOX Global Network of Poison Centers

NIEHS is an active member of the 2020 WHO Chemical Risk Assessment Network Meeting Planning Committee. NIEHS had committed to host the Network Meeting at the National Institutes of Health Campus in Bethesda, Maryland, in June 2020. NIEHS secured facilities, a support contractor, and a hotel block for participants; however, the COVID-19 pandemic forced the cancellation of the 2020 meeting. NIEHS remains an active participant in the working group for the next in-person meeting.

In lieu of an in-person meeting, the Network started a monthly webinar series to continue to connect and train network participants. NIEHS provided in-kind logistics and planning support for six of these webinars. NIEHS NTP Director Brian Berridge, D.V.M., Ph. D., D.A.C.V.P., participated on the “Characterizing Hazard and Risk in Mechanism-Based Toxicology” webinar in August 2020.

In addition to Network activities, NIEHS has supported the Global Chemicals and Health Network (GCHN) through in-kind assistance and participation in GCHN events.

WASHINGTON D.C., USA

World Health Organization

Third Meeting of the

2020 WHO CHEMICAL RISK ASSESSMENT NETWORK

SAVE THE DATE

Week of June 8-12, 2020

Hosted by

NIH National Institute of Environmental Health Sciences

On the campus of the National Institutes of Health in Bethesda, Maryland

The poster features a background image of the National Institutes of Health building in Bethesda, Maryland, with a large '2020' graphic in the upper right corner.

WEBINAR SERIES

World Health Organization

Department of Environment, Climate Change and Health

Traditional approaches to toxicology have largely depended on the characterization of hazards in animal studies and exposure-based human risk assessment. A need to be more efficient in identifying hazards and who they specifically apply to requires a different approach. This presentation will explore concepts that have defined our current approaches, needs that are prompting the development of new ones and how the National Toxicology Program is working to define the future of hazard and risk assessment in environmental health.

Characterizing Hazard and Risk in Mechanism-Based Toxicology

Webinar

Wednesday, 12 August 2020

Network focal points and their colleagues are invited to join us for a webinar on 12 August, part of an ongoing series of Network webinars throughout 2020.

This online event will take place 14:00-15:30 (UTC+2/CEST).

Please register in advance at:
<https://nih.webex.com/nih/onstage/g.php?MTID=e726842379b472b0801de3189eb3e96a8>

Speaker: Dr. Brian Berridge

Scientific Director
National Toxicology Program Division
National Institute of Environmental Health Sciences, USA

The poster features a background image of a molecular structure with a large '2020' graphic in the upper right corner.

RECENT AND FUTURE GEH FUNDING OPPORTUNITIES AT NIEHS

U.S.-India Collaborative Environmental Health Research Program

NIEHS and the Indian Council for Medical Research (ICMR) launched the U.S.-India Program for Environmental Health Collaborative Research in summer 2020. The program aims to stimulate and promote collaborative basic, translational, and clinical research between American and Indian researchers to gain a comprehensive understanding of the impacts of environmental insults on children and adults across all organ systems. Grants will be awarded to American and Indian researchers and to be funded by NIEHS and ICMR respectively. To support this program, the initiative released a [funding opportunity announcement](#) in summer 2020. The grants will be awarded by May 2021.

Harnessing Data Science for Health Discovery and Innovation in Africa Program (DS-I Africa)

NIEHS staff joined planning efforts to create new funding opportunities for the [Harnessing Data Science for Health Discovery and Innovation in Africa Program](#). The grant program seeks to leverage data science technologies and NIH investments to develop solutions to the continent's most pressing public health problems. The program harnesses a robust ecosystem of new partners from academia, government, and the private sectors. The funding opportunity announcements, released in July 2020, cover the four following areas:

- Research Hubs
- Research Training
- Ethical, Legal, and Social Implications
- Open Data Science Platform and Coordination Center

NIEHS staff participated in the creation of the DS-I Africa Virtual Symposium Platform. The virtual symposium platform, open from July through November 2020, included networking and outreach events. Summer 2020 topics included:

- Data Science Partnerships
- Harnessing Innovation and Entrepreneurship for Data Science for Health
- Training the Next Generation of Leaders in Data Science and Health Innovation
- Ethical, Legal, and Social Implications of Data Science Research
- Data Ecosystems and Gateways to Foster Research Community Networks Across Africa

Global Environmental and Occupational Health (GEOHealth)

NIEHS remains a partner in the [Global Environmental and Occupational Health \(GEOHealth\) Program](#), a jointly funded effort with the Fogarty International Center (FIC). The Program supports the development of institutions in low- and middle-income countries (LMICs) serving as regional hubs for collaborative research, data management, training, curriculum and outreach material development, and policy support around high-priority local, national, and regional environmental and occupational health threats.

FIC, NIEHS, and funding partners at the National Cancer Institute (NCI) and the Office of Research on Women's Health (ORWH) issued a recent notice of intent to publish a funding announcement for Hubs of Interdisciplinary Research and Training in Global Environmental and Occupational Health.

An aerial photograph of a river delta, showing intricate patterns of water and land. A large, semi-transparent green rectangular area is overlaid on the upper portion of the image, serving as a background for the text.

**“Throughout history,
outbreaks and
pandemics have changed
economies and societies.**

**This one will be no
different. In particular,
the pandemic has given
new impetus to the need
to accelerate efforts
to respond to climate
change. The pandemic
has given us a glimpse
of our world as it could
be: cleaner skies and
rivers. Building back
better means building
back greener.”**

—www.who.int



National Institute of
Environmental Health Sciences

National Institute of Environmental Health Sciences
National Institutes of Health
U.S. Department of Health and Human Services