160th NICHD National Advisory Council

Advancing Global Maternal and Child Health: Opportunities and Challenges

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Why should NICHD be involved with Global Health Research?

- **Recent health crises**: (e.g., Ebola and Zika virus) impact of increased mobility, travel, migration, use of social media.
- **Unique research needs**: unique vulnerabilities infants, children, and pregnant women face during public health emergencies.
- **Fragile health systems**: demonstrating need for capacity building for more effective local emergency responses to prevent epidemics.
Why should NICHD be involved with Global Health Research?

• **Impact of poverty on health**: risk of poor long-term health and developmental outcomes that can often be averted with early, evidence-based interventions.

• **Under-trained and resourced scientists**: to conduct research for a local evidence base for informed health program and policy decisions, and to respond effectively to local health emergencies. Risk of brain drain.

• **Ongoing cycle of inaction**: which prevents children and their families from thriving and reaching their full life potential.
Impact of NIH-supported research on child health and development in US and globally

• **Disease and disability have no borders:** innovative health discoveries that will benefit humanity are welcome developments to our global community, wherever they occur.

• **NIH’s peer review system:** awards the best science wherever it is conducted in the world.

• **JAMA article:** “What the United States Has to Gain From Global Health Research,” Dr. Roger Glass, Director, Fogarty International Center. *JAMA.2013;310(9):903-904*
September 2000, adoption of the United Nations (UN) Millennium Declaration at UN Headquarters in New York, committing to a global partnership to reduce extreme poverty and setting out a series of time-bound targets - with a deadline of 2015, known as the Millennium Development Goals (MDGs).
Background: Millennium Development Goals

Targets (between 1990 and 2015):

**MDG4:** Reduce by two thirds, the under-5 mortality rate:
- **Indicator 4.1** Under-five mortality rate
- **Indicator 4.2** Infant mortality rate
- **Indicator 4.3** Proportion of 1 year-old children immunized against measles

**MDG5:** Reduce by three-quarters, the maternal mortality ratio:
- **Indicator 5.A** Improve maternal mortality ratio
- **Indicator 5.B** Universal access to reproductive health care
MDG 4 & 5: Current Status

• MDG 4: Under 5 Child Mortality since 1990:
  • Estimated 48 million lives saved in children under age five if the under-five mortality rate had remained at the same level as in 2000
  • Annual number of under-five deaths worldwide has declined from 12.7 million in 1990 to 5.9 million in 2015
  • A total of 16,000 children die each day in 2015.

• MDG 5: Maternal Mortality Ratio since 1990:
  • The maternal mortality ratio has been cut 43.9%, and most of the reduction occurred since 2000.
  • The global MMR fell from 385 deaths per 100,000 livebirths in 1990, to 216 in 2015 with 303,000 maternal deaths in 2015.
  • After years of slow progress, only half of pregnant women receive the recommended amount of antenatal care.

What’s next?

Sustainable Development Goals (SDGs)

- Adopted September 2015 at UN Sustainable Development Summit
- 17 Goals and 169 Targets
- Came into effect on January 1, 2016 with full implementation by 2030
The U.S. Government (USG) and Global Health

- USG involvement in global health spans over 100 years
- Largest funder and implementer of global health programs world-wide
- Less than 1% of $4 trillion U.S. federal budget spent on foreign aid
- Foreign aid comprised of global health, economic development, and humanitarian assistance
- ~21% of foreign aid budget dedicated to global health
Role of the USG in Global Health

- Operates programs and delivers health services (e.g., PEPFAR, USAID initiatives)
- Provides technical assistance/capacity-building
- Participates in international health bodies (e.g., WHO, UNICEF)
- Conducts research (e.g., NIH, CDC)
- Supports international responses to disasters and other emergencies (e.g., USAID OFDA, USPHS)
- Engages in bilateral and multilateral activities
Figure 2

U.S. Global Health Funding, FY 2006-FY 2016 Request

In Billions

2006: $5.3
2007: $6.6
2008: $8.3
2009: $9.2
2010: $10.0
2011: $9.7
2012: $9.8
2013: $9.6
2014: $10.1
2015: $10.1
2016: Request $9.9

NOTES: Represents total known funding provided through the State Department, USAID, CDC, NIH, and DoD. Includes base and supplemental funding. FY13 includes the effects of sequestration. FY15 is based on funding provided in the “Consolidated and Further Appropriations Act, 2015” (P.L. 113-235) and is a preliminary estimate. Some FY15 and FY16 funding for malaria programs at DoD is not yet known and is assumed to remain at FY14 levels. Some FY15 global health funding provided through the Economic Support Fund (ESF) and Development Assistance (DA) accounts is not yet known; for comparison purposes, FY15 ESF and DA amounts are estimated using the lower level of funding in either FY14 Final or the FY16 Request, which is likely to be a conservative estimate.

Figure 9

U.S. Global Health Funding, By Sector, FY 2016 Request

In Millions

- HIV: $5,240 (53%)
- MCH: $1,208 (12%)
- Global Fund: $1,107 (11%)
- Malaria: $875 (9%)
- FP/RH: $613 (6%)
- TB: $195 (2%)
- Nutrition: $141 (1%)
- NTDs: $87 (<1%)
- Global Health Security: $127 (1%)
- Other: $263 (3%)
- Vulnerable Children: $15 (<1%)

Total = $9.9 billion

NOTES: Represents total known funding provided through the State Department, USAID, CDC, NIH, and DoD. HIV includes funding through State/OGAC, USAID, CDC, NIH, and DoD. Malaria includes funding through USAID, CDC, NIH, and DoD (some FY16 funding for malaria programs at DoD is not yet known and is assumed to remain at FY14 levels). TB, Nutrition, NTDs, and Vulnerable Children include funding through USAID. MCH includes funding through USAID and CDC as well as contributions to UNICEF. FP/RH includes funding through USAID as well as contributions to UNFPA. Global Health Security includes funding through USAID and CDC. “Other” includes funding through USAID, CDC, and NIH as well as contributions to WHO and PAHO.

Figure 11

U.S. Global Health Country Funding by Region, FY 2014

Total = $5.9 billion

HHS Office of Global Affairs

• Represents the Secretary and HHS in discussions of international matters with U.S. and foreign representatives

• HHS Global Strategy contributes to the achievement of U.S. government goals and principles in the areas of HIV/AIDS, malaria, tuberculosis, neglected tropical disease, maternal and child health, nutrition, safe water, sanitation, food security, and hygiene by focusing on women-centered programming, country ownership, integration and coordination, and health systems strengthening
NIH Overview

• Dr. Francis Collins, Director, NIH has identified Global Health as a high priority during his tenure.

• Global health research and training portfolios of the 27 Institutes and Centers are highly variable and disease specific.

• Within USG framework, NIH provides research expertise on global health topics.

NIH Building 1, Main Campus
Bethesda, MD
NIH-Wide Global Health Research Portfolio

- 7,195 NIH extramural foreign awards and domestic awards with foreign components in FY ‘15
- 24 ICs plus NIH OD make such awards; all regions have awards
- Great variation in number of awards by IC and by region/country
- 12.7% of foreign awards are to low and middle income countries.
FY15 NIH Extramural Foreign Awards & Domestic Awards w/ Foreign Component(s) by IC, (N = 7,195)
Fogarty Research vs. Training Expenditures
Includes all Fogarty expenditures on FIC extramural programs and non-Fogarty extramural programs

<table>
<thead>
<tr>
<th>Year</th>
<th>Training</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2010*</td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td>FY2011</td>
<td>77%</td>
<td>23%</td>
</tr>
<tr>
<td>FY2012</td>
<td>79%</td>
<td>21%</td>
</tr>
<tr>
<td>FY2013</td>
<td>81%</td>
<td>19%</td>
</tr>
<tr>
<td>FY2014</td>
<td>82%</td>
<td>18%</td>
</tr>
</tbody>
</table>

*NOTE: 2010 includes ARRA

Source: FIC Budget Office
Fogarty Research Portfolio Expenditures (FY 2014)

Includes leveraged expenditures

NIH Co-funders contributed 67%

Source: FIC Budget Office; QVR
Sample of Recent NICHD Science Advances from our NICHD Divisions/Centers

- **DIR: South Africa:** Combating the evolution of antibiotic resistance in Mycobacterium tuberculosis.
- **DER: India:** Men engaged in family planning in rural India led to improved contraceptive practices and reduced sexual intimate partner violence.
- **DIPHR: Denmark:** Determinants and health implications of diabetes in pregnancy on women and their children.
- **NCMRR: Foreign Co-PI:** Transcranial Direct Current Stimulation in Chronic Spinal Cord Injury
NICHD Office of Global Health

• Providing leadership in the development of cross-cutting policies, plans, and programs related to NICHD’s global health research
• Building and maintaining global health partnerships and collaborations
• Assisting the Institute’s components in enhancing their international research portfolios and other global health activities
2015 NICHD International Activities Catalog

Available online at:
FY 2015 NICHD Funding: $1.29 Billion

Spending at NICHD:
- $186.3 M Intramural Research
- $68.9 M Research Management & Support

Spending outside NICHD:
- Supports 2,749 Extramural Awards
- 397 New RPG Applications Awarded

- $255 M (20%)

- $1.032 B (80%)
NICHD’s Total Expenditure for Global Health Related Activities for Fiscal Year 2015…

- Total International Funding: $115,086,116
- 286 funded grants and projects related to global health research
- 138 countries (including unincorporated territories e.g., Hong Kong, Puerto Rico, etc.)
138 Countries with Global Health Related Activities for Fiscal Year 2015
Major Areas of Science Funded and Mechanisms for GH Related Awards in 2015

Health/Science Areas

- Maternal, neonatal, and child morbidity and mortality
- Healthy pregnancy, reproductive health, family planning
- HIV/AIDS (including prevention), mother to child transmission
- Infections, malaria, tuberculosis, hepatitis B
- Gastrointestinal diseases, diarrhea in children
- Food insecurity, nutrition, breastfeeding
- Training Activities (e.g., researchers, physicians, nurses, health interventions, research administration…etc.)
### Distribution of NICHD GH Awards for 2015

<table>
<thead>
<tr>
<th>Region</th>
<th>$ Total for all Activities</th>
<th>Percent Total NICHD of GH Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>$62,941,196</td>
<td>54.7%</td>
</tr>
<tr>
<td>Americas</td>
<td>$19,759,982</td>
<td>17.2%</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>$2,319,237</td>
<td>2.0%</td>
</tr>
<tr>
<td>Europe</td>
<td>$9,885,054</td>
<td>8.6%</td>
</tr>
<tr>
<td>South-East Asia</td>
<td>$12,157,493</td>
<td>10.6%</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>$7,806,628</td>
<td>6.8%</td>
</tr>
<tr>
<td>Countries without regions or</td>
<td>$215,886</td>
<td>0.2%</td>
</tr>
<tr>
<td>Unincorporated Territories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e.g. Hong Kong, Puerto Rico...)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Total International Funding:** $115,086,116
Top 15 Countries That Received NICHD Funding for Fiscal Year 2015

- SOUTH AFRICA: 15,170,712
- UGANDA: 11,834,663
- KENYA: 10,470,221
- MALAWI: 5,296,177
- THAILAND: 4,719,671
- CHINA: 4,050,201
- BRAZIL: 3,725,049
- INDIA: 3,572,825
- TANZANIA: 3,519,806
- BOTSWANA: 3,276,405
- CANADA: 3,198,624
- ZAMBIA: 2,858,301
- ARGENTINA: 2,521,157
- PERU: 2,084,887
- ZIMBABWE: 2,558,777
Mechanisms for Global Health Awards in 2015

- R01: 61%
- Cooperative Agreements: 15%
- Other Research Grants: 15%
- Intramural Research: 1%
- Training and Career Development: 3%
- Research Contracts: 3%
- Centers: 2%
OGH: Global Health Activities

- **Participation in Interagency and Trans-NIH Global Health Initiatives** (e.g., NIH-BMGF Collaborations; IOM Investing in Young Children Globally Forum; USAID Children in Adversity Initiative)

- **Organizing and Co-sponsoring NIH Global Health Consultations** (e.g., NICHD Global Health Meeting, NICHD Global Injury Meeting, Fogarty Brain Disorders Meeting)

- **Coordination of Visits by Foreign Delegations** (e.g., Cuban Minister of Public Health; Health Minister from Rwanda, Chinese National Science Foundation, Indian Department of Biotechnology)

- **Planning of International Site Visits by Senior NICHD, NIH, DHHS, and Congressional Leadership** (e.g., China, Korea, South Africa, and Tanzania)

- **Dissemination of NICHD Global Health Research Evidence** (e.g., UN, WHO, HHS Global Health Maternal and Child Health policy documents)
New Phase of Cooperation Between NIH and the Bill and Melinda Gates Foundation

The NIH and BMGF have established milestone-driven collaborations in 8 areas:

- Maternal and newborn health
- Contraceptive research
- Child health and development
- Pediatric pneumonia and indoor air pollution
- HIV/AIDS
- Malaria
- Tuberculosis
- HPV/Cervical Cancers
IOM Forum: “Investing in Young Children”

- IOM launched this Forum with over 40 public and private partnering agencies.
- Goal to identify innovative international research and translate this evidence into policies and practices in health, nutrition, education, and social protection for children and their families in resource-limited settings.
- NICHD serves on the Executive Committee and the Mental Health and Development Delays and Disabilities Working Group, and several planning committees for regional meetings.
US Ebola Response and Research Agenda

- LCDR Margaret Brewinski Isaacs, MD, MPH, provided clinical care to health care workers affected by the Ebola virus in Liberia and conducted trainings on infection control in Sierra Leone.
- Presented at the American College of Preventive Medicine and the Howard County (Maryland) Emerging Infectious Diseases Symposium.
- Spoke on MCH Ebola considerations at NIH-hosted, USG Ebola Research Meeting.
USG “Children in Adversity” Initiative

• OGH representatives serve on the technical working group in line with Public Law 109-95: Assistance for Orphans and Other Vulnerable Children in Developing Countries Act

• A description of this initiative aimed at developing a research agenda and whole-of-government strategy for work with children in adversity in LMICs was published in the *Lancet* and a special issue in *Child Abuse and Neglect*.

• A strategy document was developed, the “Action Plan on Children in Adversity” and launched at the White House.
NICHD Global Health Consultation on Child Neurodevelopment, Nutrition, and Inflammation

- Children born into poverty are at heightened risk of poor health and developmental outcomes - need for bridging of the child survival and child development fields.
- Meeting included 80 researchers and representatives from multiple NIH ICs, BMGF, OGA, CDC, USAID, WHO, World Bank, Sackler Institute, Grand Challenges Canada.
- *Pediatrics* journal supplement in fall 2016 on cross-cutting assessment issues and key developmental periods. Will explore new research opportunities with partnering agencies.
NICHD Supported
Global Health Research
NIH Zika Cohort Study

• Multi-site, multi-country prospective observational cohort study
• Objective: to assess the strength of association with Zika infection during pregnancy and adverse maternal/ and full spectrum of fetal outcomes while controlling for potential confounders
• Protocol in development
• Enrollment target: June 2016
PAR-16-106 - Rapid Assessment of Zika Virus (ZIKV) Complications (R21)

- Open March 20, 2016 and expires on March 1, 2019
- Applications accepted on a rolling basis, beginning on April 20, 2016

Provides an expedited (rapid) funding mechanism for research on Zika virus (ZIKV) and its complications given the urgent need to determine whether ZIKV infection causes microcephaly and other congenital abnormalities in babies and the potential rapid spread of ZIKV to the United States.
International Maternal Pediatric Adolescent AIDS Clinical Trials

• **Purpose:**
  • Reduce mother-to-infant transmission of HIV
  • Evaluate pharmacological treatment for HIV-infected children, adolescents, and pregnant women
  • Evaluate vaccines for the prevention of HIV transmission in adolescents

• **Funding in multiple countries including:** Botswana, Brazil, India, Malawi, South Africa, Thailand, Tanzania, Uganda, and Zimbabwe
Purpose: generate large data sets to address high priority research questions and streamline HIV/AIDS research

- Collect and define key variables
- Harmonize data
- Implement methodology to pool data

NICHD supports inclusion of patient data on infants, children, adolescents and pregnant women
Global Network for Women and Children’s Health Research

- Aims to build research partnerships to conduct research on feasible, cost-effective, sustainable interventions to address the major causes of perinatal morbidity and mortality of women and children in the developing world.
- Consists of teams of US mentors at US universities and international teams in the Democratic Republic of the Congo, Guatemala, India (2 sites), Kenya, Pakistan, and Zambia.
- More information: https://gn.rti.org/
Global Network for Women and Children’s Health Research

Sample Topics

- Registry of all births and deaths in 100 clusters → population based studies and outcome evaluation
- FIRST BREATH resuscitation trial
- Emergency OB and Neonatal Care trial (access to care, improve birth preparation and community stabilization, OB and neonatal transport and quality hospital care)
- Antenatal Steroid Trial (use FIRST Breath and EmONC as platform to save preterm babies and moms)
- Complementary feeding trial in 4 countries to improve linear growth and cognitive outcome
Biomarkers of Nutrition for Development (BOND)

- Collaboration to develop a unified approach to examine the scientific basis for choosing appropriate biomarkers
- Assess the function and effect of diet and nutrition on health and disease
- Support the development and evaluation of evidence-based programs and policies to improve diet and nutrition
- Produce a web-based resource available to the global health community

Executive summary—Biomarkers of Nutrition for Development: Building a Consensus


ABSTRACT

The ability to develop evidence-based clinical guidance and effective programs and policies to achieve global health promotion and disease prevention goals depends on the availability of valid and reliable biomarkers. With specific regard to the role of food and nutrition in achieving these goals, nutrient data are developed both to inform on the effect of nutrient exposure, status, and functional effect. A continued need to develop new biomarkers is driven by the need to inform on the complex effects of food and nutrition on health. The objective of the present study was to assess the function and effect of diet and nutrition on health and disease, support the development and evaluation of evidence-based programs and policies to improve diet and nutrition, and produce a web-based resource available to the global health community.

INTRODUCTION

The global health community has increasingly recognized the integral role of food and nutrition in health promotion and disease prevention. It is estimated that globally, maternal and child undernutrition results in 3.3 million deaths per year and accounts for 30% of the disease burden in children <5 y of age (1). Within the broad context of undernutrition, the “hidden hunger” of vitamin and mineral deficiencies afflicts >2 billion individuals in both developed and developing countries (2), putting a major challenge (3). The ability to assess the role of nutrition in disease prevention and health promotion is predicated on the availability of accurate and reliable biomarkers that reflect nutrient exposure, status, and function. A continued need to develop new biomarkers is driven by the need to inform on the complex effects of food and nutrition on health. The objective of the present study was to assess the function and effect of diet and nutrition on health and disease, support the development and evaluation of evidence-based programs and policies to improve diet and nutrition, and produce a web-based resource available to the global health community.

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1. From the Kaiser Family Foundation, National School of Tropical Medicine and Human Development, National Institutes of Health, Bethesda, MD 20892 and NAIU, the Liverpool School of Tropical Medicine, Pasteur Place, London, United Kingdom; and the Institute for Health and Nutrition Research, University of Toronto, Toronto, Canada. 2. The Institute of Nutrition, National University of Colombia, Bogota, Colombia. 3. The Biostatistical Research Unit, Institute for Health and Nutrition Research, University of Toronto, Toronto, Canada. 4. Collaborating with the Institute of Health and Nutrition Research, University of Toronto, Toronto, Canada.
Iron & Malaria Project

- **Purpose**: establish best practices to prevent and treat iron deficiency in populations where malaria and other infections are endemic
  - Define mechanisms of immune function by which iron may interact with infections
  - Identify biomarkers of exposure, status, and function for prevention and treatment of iron deficiency
  - Determine the safety and effectiveness of iron preparation and iron-related interventions for preventing and treating iron deficiency
Positive Outcomes For Orphans

• **Goal**: provide evidence to communities, policymakers, and funding agencies for optimal and feasible care options for orphans and abandoned children

• Longitudinal research study of children age 6 and above
  Effects of life events, placement, caregiver characteristics, and cultural settings on:
  • Behavior and emotional adjustment
  • Learning and development
  • Health outcomes

• Six study sites:
  Kenya, Cambodia, Tanzania, India (2 sites), and Ethiopia
Population Dynamics

- **Social and Behavioral Science Capacity Building**: the Partnership for HIV/AIDS Research in Kenya, Botswana, Uganda, South Africa, Russia, Indonesia, China and Vietnam.

- **The Role of Women’s Empowerment**: reproductive health risks and outcomes and in and socio-economic well-being. Studies are being undertaken in India, Bangladesh and various nations in Africa.

- **Fertility and family planning**: included in this portfolio are high risk behaviors that lead to STD’s and AIDS.

- **Population growth, migration and environmental change**: all impact family size and both collective and individual health.
NIH RePORTER – Matchmaker – NEW FEATURE
https://projectreporter.nih.gov/reporter_matchmaker.cfm?new=1
Questions?