Capacity Development in Developing Countries: the view from a government funding agency

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Disease Is Global – Response Must be Global

- Epidemics are occurring for all types of illnesses
- Insect and Other Vectors
- Ideas
- Lifestyles
Why in Developing Countries?

- Burden of Disease will be highest there
- Local Evidence is needed
- Study problems important for specific countries
- More research for the money expended
- Translation will be best done with local research
- Sustainability – Conflicting needs
- Train researchers in the North, they will think like the North
- Policy makers need local data
Order

1. Understand the problem
   Specific problems of the developing world e. g. Aral Sea

   Disaster
   nutritional
   problems

2. Generate the tools
   land use issues
   surveillance educational
Results of Good Research
Capacity Building

Improved Health Status for all
Improved knowledge for all
Increased partnerships and collaborations
Economic Productivity
Where are the Researchers Now?

80% Developed World
20% Developing World
### Research and Development Scientist By Region

<table>
<thead>
<tr>
<th>Region/Country</th>
<th>R&amp;D Scientists and Engineers (000)</th>
<th>Population (millions)</th>
<th>R&amp;D Scientists per 1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>582.0</td>
<td>256.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Central and Eastern Europe</td>
<td>389.9</td>
<td>151.0</td>
<td>2.2</td>
</tr>
<tr>
<td>Commonwealth of Independent States</td>
<td>477.8</td>
<td>289.0</td>
<td>2.6</td>
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<tr>
<td>United States</td>
<td>633.7</td>
<td>252.5</td>
<td>2.5</td>
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<tr>
<td>Canada</td>
<td>49.3</td>
<td>29.8</td>
<td>2.7</td>
</tr>
<tr>
<td>Japan</td>
<td>47.6</td>
<td>129.8</td>
<td>4.0</td>
</tr>
<tr>
<td>Australia-New Zealand</td>
<td>48.3</td>
<td>21.2</td>
<td>2.3</td>
</tr>
<tr>
<td>Latin America</td>
<td>138.3</td>
<td>484.8</td>
<td>0.3</td>
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<tr>
<td>Sub-Saharan Africa</td>
<td>176.8</td>
<td>452.6</td>
<td>0.4</td>
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<tr>
<td>China</td>
<td>291.7</td>
<td>1204.8</td>
<td>2.3</td>
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<tr>
<td>India</td>
<td>108.0</td>
<td>827.7</td>
<td>1.3</td>
</tr>
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Problems for Researchers in Developing Countries

- Positions at the Institution
- Space for research
- Equipment
- Supplies
- Assistants
- Job security
- Protected time specific for research
“Capacity Building in countries in greatest need must remain a priority issue for the international community. We need a quantum leap in capacity building.”

Dr. Gro Bruntland
Director General, WHO
January 1998
Examples of Types of Programs at Fogarty International Center

- Basic Science
  - FIRCA
  - GRIP
- Applied Science
  - ITREOH
  - AITRP
- Clinical Research
  - Tobacco Control
  - Neuroscience
- Operational
  - ICOHRTA
Building Capacity – Who Starts?

- **Step one:** local small development, e.g. ACS small grants program
- **Step two:** international collaborations
  - Think on the proper scale
  - Within budget and technical constraints
- **Step three:** develop a cohort of researchers
- **Step four:** develop local programs to train others
Building International Capacity in the U.S.

Develop an interest in research
- MIRT Program
- Fogarty/Ellison Fellowships
- Howard Hughes Fellowships
- IRSDA

Develop capability and collaborations
- AITRP -- AIDS INTERNATIONAL TRAINING AND RESEARCH
- FIRCA -- FOGARTY INTERNATIONAL COLLABORATION
- GRIP -- GLOBAL RESEARCH INVESTIGATOR
Developing a Program in the Developing Country

- Needs assessment done by a team from within the country and outside
  - Consultations: e.g. Stigma; e.g. Trauma

- Research training
  - Shortages: Qualitative and Quantitative
  - Levels of work
    - Local, regional, district, national level scientists
    - More likely to have a direct impact as well as a policy impact
    - Know more about alternative possibilities
    - Leads to self-reliance
Develop In-Country Priorities

- Research training $\rightarrow$ Research vs. implementation
  - What works? Or How do we get what works in practice?

- Specific needs, e.g. environmental and occupational health priority
  - Example of Fogarty response: ITREOH

- Mismatch of types of research: where is the country strengths and gaps
  - China -- genomics
  - Russia -- space studies
Needs of the Local Scientist Community to Build Capacity

- Identify the qualified (potential) scientists
- Offer training
  - Home
  - Abroad
  - Address concerns of brain drain
- Remuneration that is sustainable and predictable
- Sustainability of the projects
e.g. Brain Disorders Research

- **Principal Investigator:** Miriam Adhikari, MD
  Department of Pediatrics and Child Health
  Nelson R Mandela School of Medicine
  University of Kwazulu- Natal
  Congella, 4013, South Africa
  Telephone: +27-31-260-4345
  E-mail: adhikari@ukzn.ac.za

- **Foreign Collaborator:** Lawrence Mybaiwa, MA, FCP
  University of Natal
  Dept of Pediatrics and Child Health
  Durban, South Africa

- **Title of Project:** Developmental Disabilities in a Time of AIDS
- **Awarding NIH IC:** NIDA
Identify Potential Scientists

- How do we find appropriate future scientists and leaders?
- Local, early training
- Nurture through school from early ages
- Obtain appropriate degrees
  - Basic scientists and behavioral scientists
- Send abroad for training when needed
- “Sandwich” approach
- Sustainable (e.g. tenured) positions
Identify People of All types for Research

- Technicians as well as PhDs and MDs
- Well-trained
- Diplomas or certificates
e.g. The International Cooperative Biodiversity Groups (ICBG) Program

a unique effort that addresses the interdependent issues of drug discovery, biodiversity conservation, and sustainable economic growth.
Scientists Need Dedicated Time

- In the U.S., scientists are expected to bring in their salary through grants and other work
  - E.g. teaching
  - Administrative work
  - Clinical Work
- Even moreso in the developing world with conflicting priorities
How To Get Research Training

- E.g. Fogarty D43 programs
  - Short courses in country: e.g. summer institutes
    - Sparkman Center Annual International Public Health Summer Institute 2005 at University of Alabama at Birmingham
      - http://www.soph.uab.edu/sparkmancontent.asp?ID=967
      - Simultaneous Chinese and Russian translation
    - U of Iowa Center for International Rural and Environmental Health summer institute held in Slovakia
      - http://www.public-health.uiowa.edu/cireh/training/int_summer_inst/
How To Get Research Training (cont.)

- Long-term
  - Masters degree
  - PhD especially in the developing world concept
    - Indigenous expertise
    - Language issues
    - Policy development
    - National Self-reliance
    - Train the trainer concepts
Distance Learning and the Developing World

- Curriculum development
- Language translations
- Increased courses offering choices
- E.g. Elluminate, Blackboard
Phases of Research

Academic Phase
Practical phase – data collection
Analytic phase

Most guard against the developing country scientists becoming data collectors for the developed country scientists
Examples of Fogarty Programs

- D43 training programs: training is done through research but research is funded through other programs (AITRP)
- FIRCA -- developing country collaboration with a U.S. institution with a “parent” grant (Renewal comes from the foreign country partner)
- GRIP – new scientists entry into being an independent researcher
- Tobacco Control Program: 50/50 split of research and training
Special Concerns

- Age of the trainee may need to be higher in developing countries
- Considerations of childbirth and other reasons to be out of the workforce or training
- Small grants may yield better pay-offs
- Specifically targeted workshops
Brain Drain or Brain Flight

“Since one in three African professionals will like to live outside Africa, African universities are actually training one third of their graduates for export to the developed nations. We are operating one third of African universities to satisfy the manpower needs Great Britain and the United States.”

Emeagwala (Nigeria)
Why Brain Drain?

- Lack of opportunity in indigenous country
- Lack of laboratory space
- Lack of equipment and supplies
- More pressing needs
- Lack of financial resources
Collaborations

Lead to on-going research benefits
Permanent partnerships
Methods
  FIRCA – tight connections
  GRIP -- loose connections
  ICORHTA AIDS/TB -- separate applications judged together
Alumni Associations through Fogarty

China
India
Thailand
Brazil
Mexico
South Africa

Alumni Association in the country on its own
  e.g. Uganda

Research networks
  e.g. Tobacco Control Program

Training networks
  e.g. Trauma and Injury
  e.g. International Environmental and Occupational Health
  e.g. AIDS International Training Program
Peer Review Systems Need to be Strong and Trusted

- NIH Peer Review System
- Expensive
- Complex
- How do we deal with grants-within-grants?
- National Science Foundation
- Program and review are one in the same
- Local institutional review system
- Other
Counter measures to Brain Drain

“Sandwich” education programs
Start-up funds
Re-entry grants
Country’s own set-asides for research, financial or in-kind
Scientific Resources

National Library of Medicine →
International Resources
  e.g. HINARI

PLoS
PubMED
Ed Central
NIH rule
U of Iowa Egranary program to distribute computer hard drives “fully loaded”

Collaborators’ connections
Leadership

Ultimate goal of research capacity building

Indigenous

Local concerns

Example of Uganda Ministry of Health
How do we measure success?

- Publications
  - Local/regional
  - Language: English/local
  - Policy makers
- Leadership positions
- Scientist positions
  - Local/regional/country/international
  - Sustainable research
How do we measure success? (cont.)

- Use of their research and its Policy implementation
- Number of trainees
- Attracting new funds
- Collaborations and linkages
Grantswriting and Budget Education

Need grants-writing education but it needs to be general, not specific to NIH or US government

Institutions need grants management education and safeguards
Bibliography

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