

Global Health Working Group Report: Analysis of Existing Strengths, Critical Gaps, and Opportunities
for Collaboration
May 2014

ANALYSIS

'Global health' ('GH') is defined as "an area for study, research, and practice that places a priority on improving health and achieving equity in health for all people worldwide. Global health emphasizes transnational health issues, determinants, and solutions; involves many disciplines within and beyond the health sciences and promotes interdisciplinary collaboration; and is a synthesis of population based prevention with individual-level clinical care" (Lancet 2009; 373:1993-1995). The Working Group, for the purpose of this report defined GH as: "A health-related project that either takes place in a country other than the United States, includes non-US partners, is targeted to non-US populations living in the US, or is global health related US-based work without international partners." GH activities in each of the nine schools within RBHS range from student opportunities for study abroad to biomedical research either on topics of relevance to the global community or undertaken in collaboration with organizations and colleagues based outside of the US. The number and impact of RU activities addressing global health is constantly expanding as is the listing of countries in which students, residents, fellows, faculty and staff are engaged in global research, service or education. Based on a survey undertaken in January-February of 2014 via the GAIA centers, we know that the RU community is working or studying in at least one-third of the countries across the globe, on all six continents.

Strengths

The bulk of GH funding at RBHS comes in the form of grants for research resulting in a large number of academic peer reviewed publications (Table 1.). In 2012 and 2013 the RBHS IRB was IRB of record for 10 non-US research projects; 8/10 projects were TB-related. The bulk of funding for HIV came into RBHS from *Prevention of Mother to Child Transmission* (PMTCT) services by the FXB Center. RU *New Jersey Medical School* (NJMS), *Public Health Research Institute* (PHRI), the *Center for Emerging Pathogens* and the *Global Tuberculosis Institute*, GTBI) all focus on infectious disease and TB research and service. Some of the research is already crosscutting and interdisciplinary such as the studies of effects of ambient and indoor air pollution and personal exposures on immunity against TB in Mexico City (*School of Public Health*, SPH).

Table 1. Sub-areas of funding and publications (2008-2014)

	Grant numbers			Funding (US \$)			Publications (#)
	NIH	Non-NIH	Total	NIH	Non-NIH	Total	
TB/HIV	51	36	87	29,719,670	25,009,616	54,729,286	265
Global Environment	7	20	27	1,415,903	3,148,986	4,564,889	68
Global, non-health							
(Legacy RU)	3	159	162	1,748,161	21,527,904	23,276,065	N/A
Environmental with global implications	21	87	108	27,470,716	104,949,100	132,419,816	N/A

N/A = information not available

While RU has a multiplicity of strengths, the Working Group believes that two GH areas are of particular strength and with some additional resources could elevate RBHS visibility and ranking to the 'best in class' within the five year period. These signature areas are TB and HIV.

TB: Excellence in TB research was formalized in 1992 with the establishment of the GTBI at NJMS that is one of three US model clinics for TB treatment and prevention. In the 22 years since, GTBI has conducted over 10 programmatically and clinically relevant drug trials with extensive programming all over the world, trained over 23,000 health care workers in the US and in 27 countries, and over 8,000 providers through distance-based learning. Major funding in the TB sector (see Table 1), primarily from NIH, has supported biomedical research at the PHRI, NJMS and SPH, including development of diagnostics, blood tests, and strain variation, environmental confounders, and clinical treatment and drug resistance surveillance and cross-cutting activities including epidemiology, engineering in infection control, TB health education and behavioral sciences.

HIV: Pediatric AIDS was first described at NJMS by Dr. James Oleske, and the relationship between TB and HIV infection was first identified by Dr. R. MacDonald of the GTBI. Over the past 5 years RBHS has been awarded \$20.7 million to support HIV-related activities in 37 countries on five continents. The work has included scaling up national HIV care and treatment, training and policy development to support national prevention of mother to child transmission of HIV efforts and crosscutting themes, such as family planning, workforce training for the conduct of clinical trials, and emergency obstetric care. Funders have included CDC, UNICEF, WHO, ministries of health and private foundations.

In summary: Based on faculty, staff and student involvement, external funding and publication output, RU's GH strengths and potential are excellent and include (1) biomedical/translational research, (2) clinical and preventive health service, and (3) education. Strengths across RU appear unequally distributed with a heavy weight on biomedical and clinical research and service on the Newark and New Brunswick campuses, and clinical and educational efforts on the New Brunswick campus. RU primary strength is in its size and diversity and potential for crosscutting interdisciplinary collaborations between biomedical sciences and disciplines such as social sciences, law, business, and the humanities. Venturing into multi-dimensional, trans-disciplinary approaches may become the key to RU's unique niche in future GH endeavors.

While strengths in research, teaching and services connected to TB and HIV are outstanding, what is and will be critical to a successful drive to excellence is the integration of additional resources from across RU, providing potential synergies, including:

Academic Breadth: RU offers more than 100 undergraduate programs in 33 schools allowing for major future program expansions capitalizing over 200 faculty engaged in GH-related teaching, research and service. Many of the schools in RBHS have collaborations with non-US universities or academic institutions as diverse as the University of Ibadan, Nigeria, the National Institute for Respiratory Diseases, Mexico City, Peking University and the Medical School at the University of Brescia, Italy. The goals of these collaborations are as varied as the academic institutions with which they are made: some facilitate faculty exchange, others support student exchanges for short (e.g., a semester) or longer (e.g. a degree program) periods of time, others facilitate the exchange of information, research or technical support for curriculum development or other purposes.

1. The GTBI has developed post-graduate courses, conferences and symposia annually since 1999 and provides preparatory training and clinical preceptorships for CDC international site assignees (Ethiopia, Botswana, Uganda) and NGOs. In 2014, the GAIA Centers provided more than \$ 160,000 to internationalize curriculum, conduct collaborative research, and build new partnerships in global health.
2. The *RWJMS Office of Global Health* (OGH) summer fellowship sends an average of 30–35 2nd year medical students abroad and provides opportunity for 20–25 3rd and 4th year medical students to work abroad as a GH elective. OGH has developed educational and research collaborations and formal agreements in many countries of the world and has sent over 250 medical students abroad in the last 5 years. The OGH led the development of a GH component for the Masters of Biomedical Sciences program and a practical complement to the Medical Spanish and Medical Mandarin initiatives.
3. Similarly, *International Surgical Health Initiative* (ISHI) has created a clinical non-credit elective for NJMS students wanting to participate in international surgery. In 2010 the *Center for Global Public Health* (CGPH) within the *School of Public Health* established an 18-credit certificate in global public health and currently develops a new concentration (45-credit Master's program) in GPH. Approximately 150 students and faculty have participated to date in the Dominican Republic Health Outreach Project at the CGPH that provides public health services to extremely poor Haitian refugees.

International reach: RHBS is currently home to 471 (336 F-1 and 135 J-1) students and scholars from at least 34 countries with \$2 million/year in revenue from tuition. RU has almost 300 formal partnerships (MoUs) with multiple domestic and international organizations in Latin America and Caribbean (25), Asia and Pacific (127), Europe & Eurasia (98), Africa (22), the Middle East (9), North America (7) and with the United Nations (1). RU and the Brazilian Fulbright Commission will bring a global health scholar to RU every semester for five years.

Global Institutional Infrastructure: Formed in July 2011, the *Centers for Global Advancement and International Affairs* (GAIA Centers) were created to expand worldwide research collaborations, strategic partnerships, opportunities for learning, and services to RU. The GAIA Centers are organized around four pillars: Global Education, Global Programs, Global Relations, and Global Services. Some of the key programs popular across the university are: Biennial Theme (currently *Global Health!*) grants to faculty and departments; Faculty and Staff Ambassadors program; and the UN affiliation. In 2014, RU was recognized for its outstanding

and innovative achievements in internationalization efforts with the Paul Simon Award for Comprehensive Internationalization from NAFSA: Association for International Educators.

Global Education: *Center for Global Education*, unit of the GAIA Centers, has linkages with 60 international institutions enabling students to study for a semester or academic year in more than 40 countries. Nearly 50 of these partnerships involve exchanges with top tier foreign colleges and universities. Since 2009, RU has been offering unique international service learning programs. Out of 13 programs in summer 2014, two in Romania (offered by School of Social Work) and in Mexico (offered by School of Environmental and Biological Sciences) are focused on GH. Four new programs in GH (Botswana, Brazil, Cuba, and Thailand) are scheduled in 2015.

Taking research to market: Numerous RBHS faculty discoveries and research outcomes have had real-world application benefits. For example, with financial support from the NIH, Dr. Alland and his collaborators developed a cartridge-based, automated diagnostic test that can identify *M.tb* and resistance to rifampicin using a nucleic acid amplification technique, called the Xpert MTB/RIF. In December 2010, the *World Health Organization* endorsed the Xpert MTB/RIF for use in TB endemic countries and declared it a major milestone for global TB diagnosis. As of June 2013, 1,402 GeneXpert systems and >3 million Xpert MTB/RIF cartridges had been procured in 88 of the 145 countries under concessional pricing.

New Jersey (NJ): The diversity of NJ population is a tremendous and untapped asset. NJ, after California and New York, has the largest percentage of foreign-born inhabitants (21% compared with 12.9% all US) and fourth largest population speaking a language other than English at home.¹ This diverse population is an enormous asset to a GH signature focus at RU. The global face of NJ requires an educated culturally-sensitive workforce to address the health care needs of a diverse population at the same time that it creates tremendous opportunities to develop pre-eminent health education, research, and practice programs in NJ communities.

Keeping in mind the working definition of GH for this report (“*project that . . . is targeted to non-US populations living in the US . . .*”) it is important to note that a number of programs run by RU faculty and staff target local immigrant populations. As examples: GTBI delivers directly observed treatment (DOT) services to Newark patients and enclaves of non-US populations with TB; RWJMS and the *Department of Family Medicine* all work in RU-affiliated health clinics in NJ that provide targeted services to non-US citizens; staff in the *Department of Human Ecology* are involved in studying the issues of community health and development in the Mexican communities of New Brunswick, NJ, and Oaxaca, Mexico; and staff at RWJMS created the *South Asian Total Health Initiative* (SATHI) to improve the health of South Asians.

Service and Technical Assistance and Humanitarian Assistance: The application of research to practice is the mainstay of RU global work. Grants in this general area cover topic areas as varied as prevention of mother-to-child transmission of HIV in Botswana (*FXB Center*, SN) and parasite control and health education in the Dominican Republic (RU-SPH). RBHS faculty is the driving force behind a range of humanitarian missions. Although these initiatives are usually privately funded (typically by the faculty member her/himself), and rarely funded adequately, their reach in terms of intellectual exchange, opportunities for student and faculty learning, and as a platform for future fundable opportunities is immense. As an example, the ISHI has undertaken 12 humanitarian missions to Sierra Leone, Haiti, Philippines, Guatemala and Ghana during which nearly 1,000 surgeries were undertaken. The RWJMS OGH faculty undertakes humanitarian and medical missions throughout the world, including “*Smile Bangladesh*”, surgical missions to Honduras, surgical missions to Ghana, through *International Health Care Volunteers’ Foundation*, and medical missions to Iraq.

Critical gaps.

While RU has identifiable strengths in the TB and HIV areas (expertise, funding, publications/publicity) and has made significant progress in internationalization efforts (curriculum, partnerships, faculty support), greater synergy must be created within RBHS and between RBHS and legacy RU schools. To date, TB and HIV research are largely isolated within the biomedical mechanistic research field. Increased synergy with academic programs throughout the university could generate additional student projects and/or GH internships/fellowships focusing on TB or HIV/AIDS that could contribute to furthering the research agenda in these areas and, alternatively, promote interest in global issues surrounding TB or HIV/AIDS among students and other future health professionals. In addition, expertise in the social sciences, particularly with regards to poverty, social justice, cultural diversity, etc., could contribute significantly to understanding approaches to preventing and treating TB or HIV/AIDS in global communities. In order to build the research, service and educational outreach aimed at preventing and treating TB and HIV/AIDS globally, RBHS lacks:

1. A structure that facilitates adequate information sharing and interschool collaboration

2. Support to build networks across RHBS and RU-legacy schools and to coordinate responses to funding opportunities;
3. Coordinated efforts to network and problem-solve administrative challenges with both national and international research/funding agencies interested in global health; and
4. A program that unifies the vast number of international students and those RU students engaging in studies abroad promoting interest and skills to work in global health

The *Working Group* is convinced that modest improvements in infrastructure, which can also be used to grow other content areas in GH, combined with a dedication to grow expertise in TB and HIV prevention and treatment across the globe will make RU “best in class” in GH in five years. The resulting disease-based model for developing GH lays the groundwork to make substantial gains in other content areas already emerging within RHBS, including environmental health, tobacco regulation and cancer research and clinical care.

Opportunities for Collaboration.

Internal opportunities for collaboration. As noted previously, RU’s signature strength is its potential to mobilize multiple disciplines to address health-related issues both locally and globally. The *Working Group* feels strongly that improved collaborations between RBHS’s nine schools, GAIA, and the legacy RU schools will create pre-eminence in GH within the next five years in HIV and TB and within ten years in other areas. Given the recent merger of RU and UMDNJ a collaborating force is needed that identifies potential synergy, suggests ideas and incubates collaborations. Specifically, considering the increasing impact of non-communicable diseases, conflict/violence, and climate change on GH, major opportunities for expansion of GH work will be in the areas of tobacco control (with *Center for Tobacco Studies at SPH*), cancer prevention (with *RU Cancer Institute of New Jersey*), conflict and violence prevention (with *Center on Violence Against Women and Children at RU School of Social Work*) surgery (*NJMS, RWJMS*) and environmental impact (*School of Environmental and Biological Sciences, EOHSI, SPH Department of Environmental and Occupational Health*).

External opportunities for collaboration. External collaborations will include collaborations with potential and current funders as well as partners and colleagues undertaking similar work. It is important to note that there are a number of opportunities available now, that can be seized immediately, should there be an infrastructure to develop corresponding proposals. The *Rutgers University Foundation* is likely to be able to assist in forming partnerships.

Potential funders and partners include the following:

- United Nations (UN) agencies, specifically UNICEF and WHO: In 2009, RU became one of a select group of 27 universities worldwide associated with the UN Department of Public Information (DPI). This gives RU students and faculty unparalleled access to UN briefings, conferences, internships, and networking opportunities. The university’s affiliation with the UN, combined with the UN’s focus on GH through initiatives such as the Millennium Development Goals; the Global Fund to Fight AIDS, Tuberculosis and Malaria; the Joint UN Program on HIV/AIDS; the United Nations Population Fund’s focus on reproductive, adolescent, and maternal health, make this an excellent opportunity for RBHS.
- US institutes, agencies and foundations such as USAID (US and in-country based offices), CDC (US and in-country based offices), HRSA, National Institute of Food and Agriculture, US Environmental Protection Agency, US Department of Agriculture, NASA, Fogarty International Center, National Science Foundation
- Philanthropic organizations such as the Bill and Melinda Gates Foundation, Robert Wood Johnson Foundation, National Geographic Society, Leakey Foundation, Bloomberg Philanthropies
- Industry: pharmaceutical industry (Merck, Novartis, Eli Lilly, Wellcome Trust, Sanofi-Aventis, Wyeth, etc.), tobacco industry
- Global governmental and private funders, e.g. government of China may be interested in research on air pollution in their country, the Korea Research Foundation

¹ Rutgers Centers for Global Advancement and International Affairs. Inventory of International Engagement, Key Findings and Results. April 2014

¹ Note that source material for the current compilation of GH-related activities at RU is from data requested by Working Group members from Banner and other grants and contracts databases, as well as the IRB database, PubMed search and includes input from Working Group members, most notably, GAIA, the FXB Center at the School of Nursing (SN) and the School of Public Health (SPH).

¹ United States Census Bureau, American FactFinder. Accessed April 27, 2014 at <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

¹ Merson, MH. University Engagement in Global Health. N Engl J Med 2014; 370:1676-1678. May 1, 2014
