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**“University of Ghana-Brown University Academic
Partnership to Address HIV/AIDS in Ghana”**

May 16, 2011 – July 31, 2013

**FINAL ASSOCIATE AWARD REPORT
October 2013**

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Association of Public and Land-Grant Universities (APLU)

PARTNERSHIP INFORMATION

Lead Partner Institutions: Brown University; University of Ghana
Secondary Partner Institutions: The Miriam Hospital, Tufts University, Yale University
Region, Country: Sub-Saharan Africa, Ghana
Performance Period: May 16, 2011 to July 31, 2013
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List of Acronyms

ACE	American Council on Education
AITRP	Fogarty AIDS International Research and Training Program at Brown University
BIARI	Brown International Advanced Research Institute
BU	Brown University
CAM	Complementary and Alternative Medicine
CFAR	Center for AIRDS Research
CME	Continuing Medical Education
eMTCT	Elimination of Maternal-to-Child Transmission of HIV
GAC	Ghana AIDS Commission
HED	Higher Education for Development
HICD	USAID's Human and Institutional Capacity Development
HIV/AIDS	Human Immuno-Deficiency Virus/ Acquired Immuno-Deficiency Syndrome
IRB	Institutional Research Board
IT	Information Technology
KNUST	Kwame Nkrumah University of Science and Technology
MARP	Most-At-Risk People
M&E	Monitoring and Evaluation
MCT	Mother to Child Transmission (of HIV)
MDG	Millennium Development Goals
NACP	National AIDS Control Program
NEGEA	Northeastern Group on Medical Affairs
NGO	Non-Governmental Organization
NIH	National Institutes of Health
Ph.D.	Doctorate Degree
TB	Tuberculosis
TUSK	Tufts University Science Knowledge base
UDS	University of Development Studies, in northern Ghana
UG	University of Ghana
UNAIDS	United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
USG	United States Government

1. Executive Summary

HIV/AIDS in Ghana is not considered a high-level epidemic, yet some sub-populations suffer from high infection rates, with a high co-morbidity rate of tuberculosis among the HIV-positive population¹. Approximately a third of infected people in Ghana receive treatment. The low treatment rate is a result of a care gap stemming from shortages in human resources, poor working conditions, low pay, lack of career development, and a shortage of medicine. The Ghana - Brown Partnership has addressed the care gap by enhancing the capacity of the University of Ghana in its educational programs, research, and community engagement.

Over the two years of implementation, the partnership had several accomplishments related to human and institutional capacity development. It has directly benefitted 1,545 individuals. The demand for the partnership's activities exceeded expectations, which explains the variance in results for several indicators, including high number of direct beneficiaries. Overall, the partnership has met or exceeded its targets through the following key accomplishments:

- Engaged several key stakeholders, including the Ghana AIDS Commission, National AIDS Control Program, the Ministry of Health, Ghana Health Services and District Hospitals.
- Reviewed curricula for four schools and developed content including lectures, hand-outs that address gaps in core competencies in HIV/AIDS prevention and treatment.
- Reached over 400 Students through college-wide seminars targeted to address curricula gaps, in areas such as antiretroviral therapy, HIV and opportunistic infections, preventing mother-to-child transmission of HIV, TB & HIV and pediatric HIV.
- Enhanced experiential learning program with 18 community attachment program.
- Developed and installed new teaching resource application (ULTRA) and trained 165 students and faculty at UoG.
- Trained over 220 participants through professional development short training.
- Reached more than 1,000 participants through Continued Medical Education (CMEs) and other outreach events.
- Awarded more than \$160,000 to a total of 18 research projects through competitive faculty development grants.
- Developed academic leadership at UG by enrolling three faculty in PhD programs and short term training through leveraged funding.

The achievements of this partnership manifested themselves as formative interventions in the lives of many people, four of which are presented in this report, which bring the story of Sylvia Takil, a nurse, who dealt for the first time in her life with caring for HIV patients at Apam Catholic Hospital through the community attachment program. Her efforts to control access to unhealthy food into the hospital provided a solution the hospital quickly adopted. Another example is the story of Gladys Dzansi, an assistant lecturer at the School of Nursing, whose AITRP scholarship will help continue her research project examining the use of mobile phones to improve treatment of people living with HIV.

Partnership activities strengthened the capacity of the University of Ghana to address Ghana's development goals, as outlined in the country's Millennium Development Goals (MDGs), including contribution to reducing child mortality and promoting maternal health. Training of healthcare workers

¹ Global Health Initiative website: <http://brown.edu/initiatives/global-health/ghana-brown-partnership-address-hivaids/ghana-brown-partnership-address-hivaids>.

to effectively manage HIV in children and women will likely have an impact on reducing child mortality in Ghana in the long-term. The project's educational, faculty development, CME, community outreach and institutional capacity activities have been directly related to combatting HIV and TB in Ghana.

2. Partnership Overview

Background. On May 16, 2011, the American Council on Education (ACE) and USAID/Ghana An associate award totaling \$1,374,806. This award was for the creation of a partnership aimed at enhancing the capacity of the University of Ghana in its educational programs, research, and community engagement that will result in improved response to HIV/AIDS challenges in Ghana. Under Associate Award # AID-641-LA-11-00001, HED made an award totaling \$1,100,000 to Brown University (BU) for a two-year partnership titled “ University of Ghana-Brown University Academic Partnership to Address HIV/AIDS in Ghana ” to collaborate with University of Ghana (UoG) in Ghana.

The Ghana – Brown partnership was designed to develop University Of Ghana’s capacity to train a multidisciplinary HIV/AIDS workforce through the College Of Health Sciences. Consisting of curriculum development, faculty development, continuing medical education, and institutional capacity building, program activities served a wide range of stakeholders including students, doctors, university faculty, researchers, and health workers.

The partnership between University of Ghana and Brown University was funded by a grant from the United States Agency for International Development as part of the Higher Education for Development program, and involved Yale and Tufts Universities.

Goals and Vision. The goal of this partnership was to develop human resource capacity aligned with Ghana's Millennium Development Goals (MDG)². The partners collaborated to enhance capacity of the University of Ghana in its educational programs, research, and community engagement that will result in improved response to HIV/AIDS challenges in Ghana. The partnership has also contributed to the achievement of USAID/Ghana Health Program Strategic Objective 7: Health Status Improved by contributing to Intermediate Result 3; coverage of HIV/AIDS prevention, treatment, care, and support, including services for the most-at-risk population (MARP). The partners addressed these issues by incorporating case-based teaching, discussion, and educational teaching materials that specifically incorporate MARPs.

The partners prioritized training healthcare workers to manage HIV effectively in children and women in order to help reduce child mortality in Ghana (MDG4, MDG5). The partnership’s revised pre-service curriculum empowered health workers to contribute to the cause with improved capacity. Another focus area was HIV related diseases, for example, TB. In line with the MDG goal to develop a global partnership for development (MDG8), the Ghana - Brown partnership was designed to strengthen a number of host country stakeholders by collaborating closely with the Ghana AIDS Commission and the National AIDS Control Program (NACP). The partnership also strengthened relationships with community-based organizations both in the West Africa Region and in Accra to develop community attachments for students, helping the fight against stigma related to HIV/AIDS and discrimination among marginalized communities.

The CME trainings and faculty development workshops during the second year of the partnership engaged educational institutions outside of UG, including Kwame Nkrumah University of Science and

² United Nations Millennium Development Goals (MDG), <http://www.un.org/millenniumgoals/>.

Technology (KNUST), the University of Development Studies (UDS) and the University of Cape Coast in Ghana.

Partnership Objectives

- 1) To improve academic programs in HIV/AIDS resulting in pre-service training for a skilled multidisciplinary workforce responsive to HIV/AIDS treatment, and prevention strategies in Ghana.
- 2) To develop excellence in education and research by strengthening faculty capacity at UG resulting in enhanced teaching, and applied research to effectively address challenges of HIV/AIDS in Ghana.
- 3) Enhance competencies of healthcare professionals in Ghana through continuous and distance education resulting in enhanced capacity of HIV/AIDS management.
- 4) To build institutional capacity of the UG resulting in better coordination of education and research and improved provision of community services in Ghana.

Collaborating Stakeholders. The Partnership worked with a wide range of stakeholders including national agencies, community organizations, and other higher education institutions in Ghana who supported pre-service and in-service curriculum development, CME trainings, and planning for the national symposium. Those included:

- National AIDS/STI Control Program
- Ghana AIDS Commission
- Ministry of Health

Partners also engaged district hospitals that placed students in the partnership community attachment programs. Students received training and practical experience working in these settings, and hospitals gained from hosting the students who upon completion of their studies will provide healthcare services to the community. The district hospitals include:

- | | |
|------------------------------------|-----------------------|
| • Apam Hospital | • Kade Hospital |
| • St. Dominic Hospital in Akwatia | • Winneba Hospital |
| • Agona Sewdru Government Hospital | • Asamankese Hospital |

The partnership also engaged other higher education institutions who contributed to program activities:

- | | |
|---|--|
| • Kwame Nkrumah University of Science
Technology School of Medical Sciences
(KNUST) | • Valley View University |
| • Komfo Anokye Teaching Hospital | • University of Development Studies in
Tamale |
| • The Korle-Bu Teaching hospital associated
with the University of Ghana College of
Health Sciences | • University of Cape Coast. |

3. Partnership Results and Performance

This section presents results and performance against the end of partnership targets. Structured around the partnership's M&E plan, the following sub section examines the partnerships' achievements and progress in relation to the objectives, outcomes and outputs as envisioned and designed by the partners.

3.1.1. Achievements and Implementation Progress

Objective 1: To improve academic programs in HIV/AIDS resulting in pre-service training for a skilled multidisciplinary workforce responsive to HIV/AIDS treatment, and prevention strategies in Ghana.

Outcome: University of Ghana offers enhanced academic programs related to HIV/AIDS

- Curriculum Development
- College-wide Student Seminars
- ULTRA Installation and Training
- ULTRA Online Training modules
- Community Attachment Program

Curriculum Development. During the first year of implementation, program staff and faculty from each school at the Ghana College of Health Sciences (CHS) created a curriculum development "School Group". In total, 36 faculty members from all seven CHS schools engaged in school working groups, some of whom were designated leaders to take ownership of the curricular development assessment and activities. Each school group convened several times during the implementation of the partnership, with consultation from Brown, Yale, and UG.

The School Groups were tasked with reviewing the existing curriculum at the Schools of Nursing, Medicine, Allied Health Sciences, and Public Health at the University of Ghana's College of Health Sciences. The groups created core documents, and a cross-reference document outlining the content or the proposed revisions to outline overlap in HIV content, relying on a review process that was created by the partners.

Schools of Medicine, Nursing, Public Health, and Allied Health Sciences (Dietetics and Medical Lab Sciences) reviewed existing courses with HIV/AIDS content and also identified courses in which HIV/AIDS content could be taught. The groups identified faculty and available resources, and proposed new topics, including case-based teaching, discussion and education; teaching materials incorporating MARP. External stakeholders including representatives from the National AIDS Control Program were invited to provide their input.

The schools were also tasked with compiling existing HIV materials to better identify needs and gaps. The curriculum review led to development of content, including lectures, materials, and hand outs that addressed gaps in core competencies.

As a result of this engaged stakeholder review, UG and Brown developed near-term and longer-term goals for curriculum development. The goals identified as long term were not completed by the partnership award end-date because of the lead time needed to obtain the necessary approvals in the university's quality assurance process for significant changes to the curriculum. This deliberate process is critical for academic courses and curricula related to medicine and public health. Shorter term goals included enhancements to existing courses in the upcoming semesters.

The partnership has had some difficulty demonstrating the work it has done on the curriculum through the F system indicator as currently defined. According to the current USAID F indicator definition, a revised curriculum needs to be offered to students in order to be counted. The partnership’s target was to revise four curricula in total (Table 2), but given the fact that approval for significant changes in curricula takes a long time to process at The University of Ghana, the chances were high that those would not be approved and offered at the institution before the end of the partnership award period of performance. In addition, delays in funding caused delays in activities related to curriculum development, thus interrupting implementation.

Table 2: Curricula Revised	
End of Partnership Target	End of Partnership Result
4	0

However, the partners created custom indicators to complement the F indicator in order to more accurately reflect the accomplishments of the partnership. Those custom indicators captured the curricula that were reviewed, student seminars that were designed to address gaps in the curricula, and the development of on-line training modules. The partner invested considerable resources and engaged several key stakeholders in order to accomplish the target for these indicators successfully. Relying solely on the F indicator would have inaccurately represented the efforts that were made by this partnership to develop their curriculum. The UG-BU partners reviewed curricula at the Schools of Medicine, Nursing, Public Health, and Allied Health Sciences.

Table 3: Curricula Reviewed	
End of Partnership Target	End of Partnership Result
4	4

College-wide Student Seminars. While developing the curriculum, the school groups identified a need for cross-school discussions and organized college-wide series seminars, covering topical gaps that were identified in the student curriculum. U.S. and UG faculty and clinicians have partnered to create presentations on topics including antiretroviral therapy, HIV and opportunistic infections, preventing mother-to-child transmission of HIV, TB/HIV, and pediatric HIV. These discussions also focused on stigma and destructive effects of both HIV treatment and prevention and MARP.

The half day seminars were available to all students from the following schools: Nursing, Pharmacy, Medicine, Dentistry, Allied Health Sciences, and Public Health. Overall, the partnership organized four student seminars, reaching a total of 406 students (Table 4). For a description of each seminar refer to **Appendix A**.

Table 4: Student Seminar Series				
Topic of Seminar	Date	Number of Participants		
		Male	Female	Total
Seminar 1: HIV and Stigma and HIV and Law	October 18, 2012	28	19	47
Seminar 2: HIV and Mental Health	January 17, 2013	55	31	86
Seminar 3: Interdisciplinary Practice	February 28, 2013	87	121	208
Seminar 4: HIV and Adherence	March 27, 2013	31	44	75
		201	205	406

ULTRA Installation and Training. The partnership designed the UG College of Health Sciences Learning and Teaching Resource Application (ULTRA) to address the shortcomings of an existing

knowledge management system. Limited in its capacity to share open-source information for students, ULTRA was developed for the CHS at UoG to improve the process through streamlining information sharing using improved and cost-effective open source technology.

Tufts and University of Ghana (UG) IT staff worked together to procure servers and other hardware, install software, and troubleshoot installation challenges. Additionally, the partnership trained two key UG IT staff responsible for ULTRA, who later trained other UG personnel on operating the the system. Overall, the partnership trained a total of 165 faculty members, IT staff, librarians, students, and other UG personnel in using ULTRA. Each training was geared towards the needs of different types of users and support staff who learned how to use and navigate the system and its tools, create courses, upload and edit course content (text, video, audio, PowerPoint), and create/complete quizzes and assignments.

To support the sustainability of ULTRA, the partnership developed modules on HIV-related topics that will be uploaded onto the system as original content, and used as a resource by UG. Refer to **Section 4** of this report for more details about the prospects for sustainability of the ULTRA system.

ULTRA Online Training Modules. The Ghana - Brown partnership was designed to interact with a wide variety of audiences and disciplines, and ULTRA was created to assist these audiences through facilitating ongoing teaching, developing curricula, creating and storing teaching materials, and scheduling. Meeting its final target, the partnership developed new ULTRA modules covering five topics:

- Antiretroviral therapy;
- HIV and opportunistic infections;
- Preventing mother-to-child transmission of HIV;
- TB/HIV and,
- Pediatric HIV

Table 5: Number of ULTRA On-line Modules	
End of Partnership Target	End of Partnership Result
5	5

The partnership has developed additional modules covering stigma and the law, adherence to medication and treatment, HIV and Mental Health, and HIV and Interdisciplinary practice. These topics, in addition to others that are under development will be added to the system as it continues to serve expanded and diverse audiences.

Community Attachment Program. The Ghana-Brown partnership developed the Community Attachment program to enhance pre-service training by sending faculty/staff and students to Ghanaian communities. The program involves students who train in medicine, nursing, nutrition, pharmacy, public health and lab sciences. Running for a period of 3-6 weeks, the program has four objectives:

- Participate in HIV/AIDS related training activities on site;
- Observe the roles of health workers for critical review;
- Observe and study the chain of supply relevant to tasks performed; and
- Provide suggestions for improving HIV education in schools based on community experience.

After visiting and identifying sites for the community attachment program, the UG Partnership office advertised the program to CHS students, and oversaw the student selection and placement process. UG staff also conducted site visits during the program to observe students in the field. Meeting its

experiential/applied learning target, the partnership implemented four new attachment programs. In total, eighteen students participated in the community attachment program, seventeen of whom completed their attachments successfully at Kade District Hospital, Winnaeba District Hospital, St. Dominic's Catholic Hospital (at Akwatia), Apam Catholic Hospital, Swedru Hospital, and Asamankese Hospital.

Table 6: Experiential/Applied Learning Offered for the First Time ³	
End of Partnership Target	End of Partnership Result
4/7	4/7

Students worked closely with the health management teams in each hospital and went on rotation in several departments. In addition to the activities prescribed by the hospitals (Table 7), the students gave talks and presentations to audiences including primary school students, hospital staff, and communities in nearby villages, whose limited means of transportations prevented them from accessing the hospital. For a list of program participants, refer to **Appendix B**.

Table 7: Community Attachment Program			
Participating Hospital	Focus of Experiential Learning	Main Activities	Presentations/Talks
Kade District Hospital	Health Management	<ul style="list-style-type: none"> Prescription editing, Dispensing medication, Health insurance claim forms, Patient counseling, Preparation of medicines, Stock checking and preparation of stock reports 	<ul style="list-style-type: none"> Discriminating against people living with HIV/AIDS- "Kill the Stigma Now".
Winnaeba District Hospital	Counseling	<ul style="list-style-type: none"> Prepackaging drugs, Filling prescriptions, Dispensing medication, Counsel patients 	<ul style="list-style-type: none"> Antibiotic resistance
St. Dominic's Catholic Hospital	HIV Clinic	<ul style="list-style-type: none"> Patients registration and vital signs Counseling new clients, Data collection Drug administration, Assisting in Ward rounds 	<ul style="list-style-type: none"> Personal hygiene Healthy living Vaginal Candidiasis Teenage pregnancy
Apam Catholic Hospital	Dispensary and the HIV clinic	<ul style="list-style-type: none"> Packing of medicines Software training, Drug purchase 	<ul style="list-style-type: none"> Adherence to drugs Importance of good nutrition
Swedru Hospital	<ul style="list-style-type: none"> Ward rounds, family planning and reproductive health care 	<ul style="list-style-type: none"> Ward observations, Vital signs, Counseling, Drugs stock, packaging and dispensing 	<ul style="list-style-type: none"> Ward observations, Vital signs, Counseling, Drugs stock, packaging and dispensing
Asamankese Hospital	<ul style="list-style-type: none"> ART clinic 	<ul style="list-style-type: none"> Patient counseling 	<ul style="list-style-type: none"> Awareness on HIV/AIDS prevention

Objective 2: To develop excellence in education and research by strengthening faculty capacity at UG resulting in enhanced teaching, and applied research to effectively address challenges of HIV/AIDS in Ghana.

Outcome: Faculty and staff skills strengthened through tailored short term training

- Short Term Training

³ Indicator calculation: Nominator: Experiential/applied learning opportunities offered for the first time.
Denominator: Total number of Experiential/applied learning offered at the host county institution, PQI/HED).

- Brown International Advanced Research Institutes (BIARI)
- Clinical and Translational Research Course at Brown University (AITRP)

Short Term Training. The partnership implemented a variety of short term training activities designed to augment faculty and staff capacity. The topics included ethics, hands-on research methods and practices, and medical education. The training sessions took place both at the host county institution and at the U.S. institution. At the time of partnership planning, the Brown-Ghana partnership did not anticipate the high demand for its short-term programs and those quickly became a high priority for faculty development. The unexpected demand provides a partial explanation for the target variance.

Table 8: Short-Term Training		
End of Partnership Target	End of Partnership Result	Variance
16	226	+210

Another possible reason for the variance is that the partners did not include activities that lasted less than four days during the design and target setting phase of the partnership. Given that HED’s short term training indicator considers activities longer than a day and less than six months as short term training, activities that lasted less than four days were included and accounted for in the partnership’s reports. Further, the partnership was not able to adjust target numbers in-between reporting periods, as per HED’s reporting policy those can be adjusted only annually, at the end of each fiscal year. Table 9 presents the list of the training activities and attendance that were carried out throughout the two year implementation. Refer to **Appendix C** for a detailed description of the training sessions.

Table 9: Short-Term Training by Type				
Topic of Training	Date	Number of participants		
		Male	Female	Total
Brown International Advanced Research Institute (BIARI)	June, 2013	2	2	4
Clinical and Translational Research Course at Brown	June, 2013	1	0	1
Ethics in Research	May, 2013	16	21	37
Developing Clinical Research Projects	February, 2013	7	6	13
Medical Education	November, 2012	32	28	60
Brown's Summer Institute on Clinical and Translational Research	May –June, 2012	3	0	3
Brown International Advanced Research Institutes (BIARI)	June, 2012	1	3	4
Tufts University Sciences Knowledgebase (TUSK) training	January, 2012	2	0	2
HIVrelated Clinical Research: Behavioral and Biomedical Advances	September 20, 2011	n/a	n/a	19
Statistics	November 23, 2011	24	19	43
Grant Proposal Writing	February 2012	17	23	40
		105	102	226⁴

⁴ Disaggregation for “HIVrelated Clinical Research: Behavioral and Biomedical Advances” was not available.

BIARI and AITRP. The partnership was able to leverage funds external to USAID/HED and provide training through two funding grants: The National Institute of Health (NIH) Fogarty AIDS International Training and Research Program (AITRP) and the Brown International Advanced Research Institute (BIARI). Overall, the partnership secured funding to provide short term training to 18 faculty members, some of which has occurred during implementation and some will take place beyond the partnership’s end date. Refer to **Appendix C** for more details about the BIARI and AITRP training, and for a list of participants.

Brown International Advanced Research Institutes (BIARI). Brown University conducts the two week Brown International Advanced Research Institutes (BIARI) once a year. The institutes are convened by University professors and feature lectures, seminars and workshops led by distinguished international guest faculty. This highly selective, residential program gives participants the opportunity to interact with colleagues while exploring Brown University’s campus and facilities.

The Institute is focused on hands-on faculty development through research projects and recruits promising junior faculty from around the globe through a highly competitive process. The BIARI is co-directed by one of the partnership’s key faculty members, Dr. Susan Cu-Uvin, Director of Global Health at Brown University.

Overall, twelve faculty members from the University of Ghana and the Kwame Nkrumah University of Science and Technology (KNUST) attended Brown International Advanced Research Institutes (BIARI). The faculty members from Ghana were chosen through a competitive process, and were fully supported through BIARI to attend the institute.⁵

Clinical and Translational Research Course at Brown University (AITRP). The NIH Fogarty AIDS International Training and Research Program (AITRP) provided participants the skills necessary for clinical research, measurement and evaluation. The summer program consists of two full credit courses covering research methods in clinical, translational, and health services, research and scientific writing, research presentation, and proposal development. Between 2011 - 2013, six UG faculty members attended the program. The course provided these researchers with the skills to compete for future grants offered through UG or Brown, or other competitive grants.

“The courses provided these researchers with the skills to compete for future grants offered through UG or Brown, or other competitive grants.”

Outcome: UG faculty and/or teaching staff competencies improved through long term training

- Long Term Training (Enrolled)

Long Term Training (Enrolled). Advanced degrees and long term training are key to enhancing and developing academic leadership at UG. Once the partnership identified schools and departments within the College of Health Sciences that would benefit from faculty with strengthened credentials, it started supporting Masters and PhD candidates through their graduate application processes.

The partnership originally targeted one long term candidate, but eventually, it was able to enroll additional two through leveraged funding from the AIDS International Training and Research Program (AITRP) at Brown. The additional faculty members were awarded Fogarty support in March 2012 and enrolled in September 2012. The candidates were admitted to PhD programs and will receive support for

⁵ Watson Institute for International Studies, Brown University: <http://brown.edu/about/administration/international-affairs/biari/about>.

the duration of their studies, including tuition and expenses, past the end-date of the partnership. Partnership leaders will continue to provide mentorship to these trainees as they pursue their doctorates over the next three to four years.

Table 10: Long –term Training - Enrolled		
End of Partnership Target	End of Partnership Result	Variance
1	3	+2

The following 3 UG faculty were fully supported by the AITRP:

- Patrick Adjei: Research on Neurological manifestation of HIV/AIDS;
- Peter Puplampu: Research on Acute coronary syndrome in patients with HIV/AIDS; and
- William Kudzi: Research on genetic and metabolic markers that are predictive of therapeutic or toxicity outcomes of antiretrovirals among HIV patients in Korle-Bu.

Outcome: Applied research skills at UG enhanced

- USAID/HED faculty development grants
- Center for AIDS Research (CFAR) grants
- Other joint research Projects

USAID/HED Faculty Development Grants. Developing expertise in clinical research was a key priority for this partnership, which required mentorship and close collaboration between UG and US faculty. The partnership relied on HED/USAID research grants, Center for AIDS Research (CFAR) leverage grants, and other leveraged grants including the Framework in Global Health grant at Brown.

Table 11: Joint Research through USAID/HED Development Grants		
End of Partnership Target	End of Partnership Result	Variance
7	6	-1

Throughout implementation, the partnership awarded a total of six \$5,000/\$10,000 grants that encouraged collaboration between researchers at UG and at the U.S. partner institutions, and promoted the research of promising leaders at UG.

The partnership created a US-UG working group for new research projects, chaired by Dr. Susan Cu-Uvin from Brown and Dr. Andrew Adjei from UG. This group was responsible for facilitating and awarding the research grants. The group developed an application for partnership research grants and disseminated this application to potential candidates at UG, focusing on seven key areas:

- HIV and TB within prisons;
- HIV and TB coinfections and treatment approaches,
- HIV in Women,
- Engagement in HIV care and long-term follow-up,
- HIV infection and cervical care,
- HIV in marginalized populations and,
- HIV in children.

The selected projects were submitted to the Internal Review Board at Brown, Miriam Hospital and UG. In total, the Ghana-Brown partnership awarded six developmental grants, missing the development target by one. Due to the competitive nature of the applications and the rigor in review, only six out of the total eight applications submitted were selected for funding. The partnership expects research activities to continue beyond the end date of the USAID grant, with the collaboration and mentorships of several Brown faculty members.

Table 12: HED/USAID Research Grants Awarded

Research Grantee	Research Topic	Award Amount
Dr. Jim Brandful . Collaborator: Dr. Mark Lurie (Brown).	Human Immunodeficiency Virus and Sexually Transmitted Infections Prevalence and Risk Factors among Migrant Workers in Ghana.	\$10,000
Jonathan Quartey. Collaborators: Tim Flanigan (Brown) and Margaret Lartey (Univ. of Ghana).	Developing Rehabilitation Strategy For Home-Based Care Among Pulmonary Tuberculosis Patients Living With Hiv/AIDS In The Accra Metropolis Of Ghana	\$5,000
Dr. Timothy Archampong Collaborators: Dr. Awewura Kwara (Brown), Dr. Tim Flanigan (Brown), and Dr. Margaret Lartey (Univ. of Ghana)	Hepatitis B viral resistance to Lamivudine (3TC) therapy in Hepatitis B (HBV)/HIV co-infected Ghanaian Patients	\$5,000
Dr. Richard Asmah (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Susan Cu-Uvin (Brown Collaborator).	Molecular Study of Human Papillomavirus among HIV Positive Ghanaian Women.	\$10,000
Dr. Alfred Yawson (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Curt Beckwith (Brown Collaborator).	Sex Differences in HIV Testing and Counseling in Ghana: Factors influencing low HIV testing among men in two fishing communities in Accra	\$5,000
Dr. George Obeng-Adjei (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Awewura Kwara (Brown Collaborator).	Putative protective effects of sulfamethoxazoletrimethoprim on malaria incidence in HIV-infected children	\$10,000

Center for AIDS Research (CFAR) grants. The CFAR grants are awarded through a highly competitive process, and the partnership assisted four applicants from UG With the application process. Each grantee was funded \$30,000 for the following research projects:

- Cephas Omenyo. "State-Civil Society partnerships for HIV/AIDS Treatment and Prevention in Ghana: Exploring Factors Associated with Success. Collaborator: Michelle Lally (Brown University).
- Richmond Aryeetey. "Sustainable food security and nutrition in HIV management in Ghana." Collaborator: Christine Wanke (Tufts University).
- Timothy Achampong. Hepatitis B viral resistance to Lamivudine (3TC) therapy in HepatitisB (HBV) and HIV co-infected Ghanaian Patients. Collaborator:Awewura Kwara (Brown). (with additional funds from HED development grant).
- Betty Norman. "Psychosocial influences on clinical outcomes in HIV infected adolescents in Kumasi, Ghana: A Pilot Study. " Collaborator: Nicole Nugent(Brown).

Other Joint Research Projects. Students and faculty at Brown participated in additional research collaborations that fall under the joint research objective of the Partnership, including eight Brown students who traveled to Ghana with support of the Partnership. These research activities include:

- Chart reviews of HIV patients,
- Investigation of HIV in post-partum women
- TB research – TB treatment outcomes & risk factor for mortality among children, and
- Molecular study of Human Pappiloma among HIV women in Ghana.

Refer to **Appendix D** for a list of Brown – Ghana’s additional joint research activities.

Table 13: Total Number of Research Grants Awarded			
USAID/HED Faculty Development Grants	CFAR Grants	Other Joint Research Projects	Total Number of Joint – Research Grants
6	4	8	18

Objective 3: Enhance competencies of healthcare professionals in Ghana through continuous and distance education resulting in enhanced capacity of HIV/AIDS management.

Outcome: Improved community training and outreach developed for HIV/AIDS

- Outreach/Extension: Continuing Medical Education (CME)

Outreach/Extension: Continuing Medical Education (CME). Continuing medical education consists of educational activities that serve to maintain, develop, or increase the knowledge, skills, and professional performance and relationships that a physician uses to provide services for patients, the public, or the profession⁶. The content of CMEs is that body of knowledge and skills generally recognized and accepted by the profession as within the basic medical sciences, the discipline of clinical medicine, and the provision of health care to the public. Overall, UG - Brown sponsored or co-sponsored seven outreach events that included five CMEs, thus meeting the end of partnership target, and reaching over a thousand of health care professionals, including doctors, physician assistants, pharmacists, pharmacy technicians, data entry staff, biomedical scientists, nurses, and midwives.

Table 14: Outreach/Extension	
End of Partnership Target	End of Partnership Result
7	7

The most popular CME events were two Medical Knowledge “Fiesta” events that brought together hundreds of health practitioner from a variety of practice areas. The events provided a wide range of practitioner resources and guidance on HIV related services in Ghana.

The CMEs were conducted in collaboration with the National AIDS Control program (NACP), providing continuous medical education in areas, such as HIV prevention, treatment, care and support for health workers in Ghana using didactic lectures, case-based discussions and experience sharing.

Program evaluations that were collected from participants indicated overall satisfaction and general recommendation that this model be applied to other programs that held annual review meetings, e.g. the Malaria Control Program, the TB Control Program, and the Ghana Health Service annual review.⁷ Refer to **Table 15** for a list of all outreach/extension events and to **Appendix F** for a detailed description.

“The ultimate goal of the event was to provide continuing medication education and to develop UG’s capacity to put on high-quality educational seminars”

⁶ Based on the definition for the Accreditation Council on Continuing Medical Education (ACCME): <http://www.accme.org/>.

⁷ Ghana – Brown Close out report, Ghana – Brown Partnership, P. 33.

Objective 4: To build institutional capacity of the UG resulting in better coordination of education and research and improved provision of community services in Ghana.

Outcome: UG faculty and students' access to HIV/AIDS education and research resources increased

- Databank of HIV/AIDS training and research materials established
- Partnership Program office established at UG
- Stakeholders meetings convened

Table 15: Outreach/Extension Events					
Name of Event	Date	Location	Number of participants		Total
			Female	Male	
Infectious Disease Update	June–July, 2011	Accra	N/A	N/A	36
CME: Medical Knowledge Fiesta 2011	August, 2011	Accra	N/A	N/A	300
CME: HIV Treatment, Care, and Support	January 2012	Sunyani, Ghana	68	110	178
CME: Northern Sector HIV Prevention, Treatment, Care, and Support Meeting	January, 2013	Kumasi, Ghana	N/A	N/A	149
CME: TB Update	May, 2013	Tamale, Ghana	N/A	N/A	63
CME: Medical Knowledge Fiesta 2012	August 2012	Accra	103	157	260
eMTCT symposium	September, 2012	Accra	N/A	N/A	100
					1,086

Databank of HIV/AIDS training and research materials established. Creating the databank was a joint effort between the Brown Program Coordinator who gathered materials from key faculty, and the UG Program Coordinator who filed lectures from UG. Brown personnel reviewed additional available resources (such as iTech and the Uganda Academic Alliance) that may be useful as ULTRA continues to develop content. Gathering these lectures, talks, and materials were useful for UG’s curriculum enhancement, and helped define core principles in HIV/AIDS.

Partnership Program office established at UG. Per the original plan of the partnership to create an “Impact Center”, the UG-BU partners have established an Office that serves as the Center for HIV/AIDS education and research at UG. This center coordinates efforts that address HIV/AIDS stigma, treatment, prevention and support, as well as developing capacities of leaders and health care professionals/workers. The purpose of establishing the Partnership Program office was to improve UGs capacity not only to coordinate ongoing activities held by this partnership, but also build its capacity to secure funding for future activities and train future project coordinators.

For example, this Center coordinated the eMCT Summit in 2012 at the UG, bringing together leaders and health workers from academia, government, NGO and community.

“Within each of the primary partnership objectives, activities have strengthened institutional capacity in significant ways. In this way, the Partnership office at UG served as a Center for Excellence in HIV/AIDS”

Stakeholders Meeting: PMTCT Symposium. The partnership hosted a day and a half summit to discuss successes and challenges in eliminating Pediatric HIV in 2015 in Ghana. The event was co-sponsored by

the Ghana National AIDS/STD Control Program (NACP), the Ghana AIDS Commission (GAC), Ghana Health Service, and the Ministry of Health. Held on April 25-26, 2012 at the College of Physicians and Surgeons in Accra, the Summit brought together stakeholders including academics, researchers, practitioners, activists, nongovernmental and community based organizations, policy makers, developmental partners, persons living with HIV, and politicians to discuss the way forward in achieving elimination of MTCT. A total of 100 people attended the summit, including The Vice President of the Republic of Ghana, H.E. Mr. John Dramani Mahama who gave the keynote address.

“... the Government of Ghana pledges an additional GHC150 million to support HIV programs in Ghana. This is a significant milestone in the fight against HIV and a solid demonstration of country ownership.” Vice President of the Republic of Ghana, H.E. Mr. John Dramani Mahama”

A workshop on the theme, “Medical Educaiton”, was conducted involving presentations, panel discussions and small group sessions led by professionals from Brown University, Tufts University and University of Ghana. presentations and discussions were held on the following topics: how people learn; integrating electronic media into health professional education; evaluation in health professional education; clinical exposures and integrating human story into medical education; open education initiatives; developing inter-professional education in Ghana; e-learning; and developing cross-program and interdisciplinary education. Workshop participants included faculty from the University of Ghana College of Health Sciences, Kwame Nkrumah University of Sciences and Technology, Valley View University, and University for Development Studies in Tamale.

3.2 Challenges

Delays in Funding. Delays in funding created significant implementation challenges. A three month delay during the first year of implementation (April – July) affected timely implementation of partnership activities, in particular those related to curriculum development and long-term faculty training. However, this delay encouraged Brown and UG to identify, engage and leverage other funding sources, such as the Brown International AIDS Training and Research Institutes (BIARI) and the Fogarty AIDS International Research and Training Program (AITRP).

The partnership ran into additional funding delays transitioning to the second year. Second year activities officially began in July, but the modification of the agreement with incremental funding was executed July 31, 2012. As a result of this delay, Brown could not issue sub-awards or release funds to UG, despite partial pre-financing from the College of Health Sciences.

Procurement and Installation of ULTRA. Procuring and installing *ULTRA* equipment and servers proved to be a great challenge during the implementation of this partnership. Cumbersome procurement regulations created bureaucratic bottlenecks that delayed the purchase and delivery of *ULTRA* servers. This delay caused a major interruption in activities aimed at training staff and faculty, and resulted with serious delay in the activity timeline.

Additional hardware problems ensued when compatibility issue prevented the installing company from configuring the servers correctly. As a result, the company had to re-install the entire system, which led to a delay of nearly two months. During the same period, the Systems Administrator from Tufts had left, and training his replacement on the systems contributed to the overall delays in *ULTRA* related activities.

Dedication and constant follow-up by UG and Tufts IT and program staff eventually led to successful procurement and installation of TUSK at UG. The *ULTRA* servers were received by UG in March 2012, and UG IT staff worked closely with Tufts IT staff to set-up the programs.

3.3 Lessons Learned

Importance of Leveraging Resources. The capacity to leverage funding was vital for the partnership's success. The ability to secure funding allowed the partners to continue with implantation and ultimately meet, and exceed its targets. The delay of funding posed a real threat to the continuation and completion activities, particularly those related to faculty training and curriculum development. The continued relationship between BU and UG will help expand UG's capacity to secure funds for future projects.

Implementing Technology based Systems. Dealing with technology based systems (e.g. ULTRA) can be sometimes difficult as a result of slow and bureaucratic procurement laws, as well as technology compatibility. Therefore, early planning is key when it comes to procurement and installation of such systems in order to avoid delays in implementation. Early planning may also help detect technical problem related to compatibility of hardware and software and prepare for effective, timely installation of systems that is based on the correct specifications.

Wide Outreach. The student community attachments were extremely successful, in part because they reached students that were training not only in medicine, but also nursing, nutrition, and lab sciences. While these types of programs are usually geared toward medical students, the participation of students from other disciplines has proved to be extremely helpful to meet the needs of diverse sites and communities.

Commitment and ownership of the partnership program. The BU and UG partners have established a close working relationship with committed and dedicated partnership directors and academic staff on both sides. Partners demonstrated their commitment by the ability of to leverage funding that supported long term training of UG faculty, joint research projects and short term training of staff and faculty at UG. Partners have continued implementing activities after the early closure of the partnership ensuring sustainability and continuity.

HED/ACE Programmatic Support. HED/ACE's programmatic support to partners has ensured effective implementation of partnership activities and provided essential technical assistance to partners in the areas of developing and periodically revising clear results framework (RF), partnership monitoring plan (PMP) and partnership implementation plans (PIP), as well as submission of timely and quality data and report in PRIME. The continuous monitoring of progress, technical assistance and troubleshooting has resulted in quality and timely submission of quarterly financial expenditure reports and semi-annual report.

4. Sustainability

Partnership Stakeholders conducted an assessment and developed strategies for the sustainability of partnership activities during the final six months of the partnership award. The partners discussed options for moving forward considering both the possibilities of being refunded and not being refunded for a third year. The two prospects that emerged in those discussions were continued faculty training and continued development and use of the ULTRA system. Continuity of the current partnership collaboration has also featured as key to sustainability.

Continued Training. The additional funding Outside of USAID that the partnership was able to secure over the past two years will continue to help support the next post-partnership steps:

- Support 6 faculty research grants as projects are implemented and completed.

- Develop teaching materials and lecture notes for pre-service training, to be uploaded onto ULTRA.
- Explore the option to develop, pilot, and post certificate online courses.
- Support short-term and long-term trainees enrolled in programs in the US and South Africa, in collaboration with Fogarty AIDS International Training and Research Program and Brown International Advanced Research Institutes.

Continued development and use of the ULTRA system. The ULTRA system can now be used to upload training modules, teaching materials and lecture notes providing easier access to students, faculty and researchers across academic units at the University of Ghana. ULTRA also has the potential to be used to expand availability of such resources to the larger community and health workers throughout Ghana.

Evaluation and Certification for Pre-service Teaching. The Partnership is interested in continuing the development of the ULTRA online-learning tool, and expand it for pre-service teaching and CMEs throughout Ghana. Further development of content and its preparation for expansion to serve CME and pre-service teaching will include the following steps:

- Development of additional modules that address HIV testing, the epidemiology of HIV in Ghana, the engagement of most at risk groups and key populations to reduce HIV transmission and an overview of Hepatitis B and C co-infection.
- Standardization of each of these modules to include case studies, reviews, and testing platforms
- Creating a certification package that would allow, pending the cooperation and collaboration of the Ghana Medical and Dental Council, CME credit upon the completion of ULTRA training modules.
- Prepare similar certification package for students in pre-service training.
- Work with faculty members at University of Development Studies (UDS), Kwame Nkrumah University of Science and Technology (KNUST) and University of Cape Coast to promote the adaptation of the ULTRA system.

Continuity of the Current Partnership Collaboration. The BU and UG partners have established a close working relationship with committed and dedicated partnership directors and academic staff on both sides. Partners have also forged important collaborative relationships with local government and non-government agencies and other funding sources. These relationships will help partners in the short and long term toward effective implementation of planned activities, coordinate initiatives and resources and ensure local ownership.

5. Success Stories

Among the many individual benefits and success stories that have been occurring as a result of the University of Ghana- Brown University partnership, four stories are highlighted in this report (refer to **Appendix F** for detailed stories):

- 1) ***Ghanaian Health Sciences Interns Explore HIV Patient Care Beyond.*** Residents living in rural communities across Ghana receive information about HIV/AIDS and prevention of the disease through basic, often limited resources offered by local hospitals and clinics. In addition, the shortage of well-trained medical professionals who offer proper care to people living with HIV/AIDS remains an ongoing public health challenge.

- 2) ***University of Ghana's College of Health Sciences preparing students for the realities of the workforce.*** University of Ghana's College of Health Sciences maintains a roster of talented lecturers across its schools. With the task of preparing students for the realities of the workforce, the University of Ghana's administrators sought opportunities to bolster the quality of education it provides to today's HIV/AIDS educators and health care workers.
- 3) ***UG faculty and students trained in ULTRA.*** Before the implementation of the University of Ghana College of Health Sciences Learning and Teaching Resource Application (ULTRA), there was no knowledge management system at the College of Health Sciences that could be used to facilitate the creation, sharing, and leveraging of information to support health sciences education and training using open source technology.
- 4) ***Nurses and HIV counselors take on the challenge of managing adolescents.*** The successful administration of antiretroviral therapy and other interventions has resulted in longer survival of HIV infected children in Ghana and as the children turn 12 years they are transferred from pediatric to adult clinics. Ghana has no practicing adolescent physicians and adolescents are managed by adult physicians.

6. Appendices

Appendix A: Student Seminars

Seminar 1: HIV and Stigma and HIV and Law: October 18, 2012. The seminar covered the following topics: HIV and the law, stigma and discrimination in health care settings, the impact of stigma and discrimination on HIV care, and violence and discrimination against most-at-risk persons. Speakers included: Dr Bernard Dornoo (National AIDS/STI Control Program), Dr. Ernest Kenu (Korle-Bu Teaching Hospital), and Chief Jones Blantari (Ghana Police Service). The seminar featured a student presentation and a nursing student presented on her research topic "*To Tell or Not to Tell: The Dilemma of People Living with HIV/AIDS in Dzodze, the Volta Region.*" There were a total of forty-seven students (28 males and 19 females) in the class coming from all the six schools of the college and the research institute.

Seminar 2: HIV and Mental Health: January 17, 2013. The partnership hosted its second half-day college-wide student seminar on January 17, 2013 at UGMS on the topic of Mental Health and HIV/AIDS. This seminar covered the following topics: neurobiology of HIV, neurological manifestations of HIV, psychiatry manifestation of HIV, HIV disclosure and mental health, HIV related stigma and mental health. Speakers came from the UGMS Departments of Medicine/Therapeutics and Psychiatry. A special feature was a talk given by a person living with HIV/AIDS, who shared her personal experience with emphasis on how she dealt with disclosure and stigma. In total, 86 participants attended the seminar with 55 males and 31 females. Based on a review of post-seminar evaluations, most participants felt the content was very good and found the presentations very useful. The majority of participants thought that this seminar will impact their work by encouraging avoidance of stigmatization. The participants highly recommended that the seminar should be organized frequently.

Seminar 3: Interdisciplinary practice: February 28, 2013. This seminar focused on education in the health professions and exposed students to contemporary education methods. Presentations covered topic on curriculum in the College of Health Sciences, how adults learn, and introduction to Inter-professional Education (IPE). The seminar was open to students from all College of Health Sciences schools, but drew mostly Public Health and Nursing students, a total of 208 students (87 males and 121 females).

Seminar 4: HIV and Adherence: March 27, 2013. The fourth college-wide student seminar focused on adherence to medications. The session lasted 2 hours and was held at the School of Nursing. Lecturers from the Schools of Public Health and Pharmacy gave presentations on adherence to antiretrovirals and other medications for adults and children. Participants were mostly from the School of Pharmacy and School of Nursing. There were a total of 75 students attending (31 males and 44 females).

Appendix B: Community Attachment Program participants and list of participating hospitals

The following provides list of participants in the community attachment program of the University of Ghana – Brown University partnership and also the list of hospitals that were engaged in the attachment program.

- 1) Mr. Mumuni Iddris – School of Nursing (SON), (Akwatia)
- 2) Mr. Haruna Taufique – School of Allied Health Sciences (SAHS), (Akwatia)
- 3) Ms. Sylvia Abena Takyi– SAHS (Apam)
- 4) Mrs Mabel Torku – SON (Apam)
- 5) Mr. Ebenezer Anobu Otu – UG Medical School (UGMS), (Asamankese)
- 6) Mr. Benjamin Awuku-Fremont – UGMS (Asamankese)
- 7) Mr. Benedict Ewusi Dadzie – UGMS (Agona Swedru Government Hospital)
- 8) Mr. Samuel Oppong – Pharmacy (Agona Swedru Municipal Hospital)
- 9) Mr. Pars Daniel Annan – Pharmacy (Winneba Municipal Hospital)
- 10) Ms. Elisha Asomaning Amponsah – Pharmacy (Winneba Municipal Hospital)
- 11) Mr. Ebenezer Adu Nyarko – Pharmacy (Kade Government Hospital)
- 12) Mr. Kwabena Nkansah Asante - (Pharmacy) Nyarko – Pharmacy (Kade Government Hospital)
- 13) Mr. Peter Paul Anekor – School of Public Health (Asamankese Government Hospital)
- 14) Ms. Francisca Nana-Aba Mccarthy – SAHS (Apam)
- 15) Ms. Dinah Lamptey – Pharmacy (Apam)
- 16) Ms. Priscilla Akua Bamfoa Botchway – SAHS (St. Dominic’s Hospital)
- 17) Ms. Sena Ahiakpah – Public Health (St. Dominic’s Hospital)

Table 16: List of Participating Hospitals	
Year 1	Year 2
<ul style="list-style-type: none"> • Apam Catholic Hospital, • St. Dominic Catholic Hospital • Asamankese Hospital 	<ul style="list-style-type: none"> • Winneba District Hospital, • Agona-Swedru District Hospital, • Winneba District Hospital, • Kade District Hospital

Appendix C: Short-term training

- 1) “HIVrelated Clinical Research: Behavioral and Biomedical Advances.” (November 2011). The partnership coordinated a half-day UG faculty development workshop entitled “HIVrelated Clinical Research: Behavioral and Biomedical Advances.” Nineteen faculty members from five UG College of Health Sciences schools and from the Noguchi Memorial Institute for Medical Research attended this workshop at the Ghana College of Physicians Conference Center on September 20, 2011. Seven faculty from Brown, Yale, and UG gave 30 minute lectures on topics including: overview and tips for developmental grants, ethics, qualitative and quantitative research methods, and HIV/AIDS in marginalized populations. The development workshop was well received, according to evaluations from participants.

- 2) Statistics (November, 2011). The partnership's second faculty development workshop was held on November 23, 2011 on the topic of statistics. It included hands-on training, and trained 43 participants (19 female and 24 males). The sessions were lively and interactive, receiving positive evaluations at the end of the training. At the end of the training, participants were able to (using secondary data) create spreadsheets, enter data and run simple analysis. Simple analysis such as frequencies, cross tabulation, determination of chi square values, confidence interval comparing means using T-test, ANOVA and simple binary regression.
- 3) Grant Proposal Writing (February 2012). The partnership's third faculty development workshop was on the topic of grant proposal writing. It drew 40 participants, including 17 males and 23 females. This workshop was held in two sessions. The first session was theory where five presentations were made on Understanding the Grant Proposal Writing Process, Problem statement, Introduction & Literature Review, Aims, objectives and methodology, and Ethical consideration and institutional review. The second session was held in the afternoon and it comprised of hands-on training to put the principles learnt during the morning session to practice.
- 4) Medical Education (November, 2013). The fourth workshop, which took place on November 15-16, 2012, was under the theme of Medical Education. The workshop consisted of presentations, panel discussion sessions, and small group sessions. Dr. Julie Taylor (Brown), Dr. Kathy Takayama (Brown), Dr. Brian Montague (Brown), and Dr. Susan Albright (Tufts) traveled from the US to present on special topics. Speakers from UG included Prof. Margaret Lartey, Dr. Akye Essuman, Prof. J.K. Acquaye, Dr Akye Essuman, Mr. Chris Yebuah, and Dr. S.Y. Oppong.

Over the two day period, presenters discussed the following topics including: how people learn; integrating electronic media into health professional education; evaluation in health professional education; clinical exposures and integrating human story into medical education; open education initiatives; developing inter-professional education in Ghana; elearning; and developing cross-program and interdisciplinary education.

Participants for this workshop were faculty from the University of Ghana College of Health Sciences, Kwame Nkrumah University of Sciences and Technology, Valley View University, and University for Development Studies in Tamale. A total of sixty-five faculty attended (37 males and 28 females). From the participant evaluations, most faculty were very satisfied with the overall meeting quality. Most of the participants considered “new tools of learning, teaching, and evaluation of programs” and “team-based learning” as the most important things they learned from this workshop.

- 5) Developing Clinical Research Projects (February, 2013). The Ghana-Brown partnership put on a 4-day faculty development workshop on the topic of development clinical research projects. This workshop, which took place on February 12-15, 2013 in Koforidua, Ghana, is the 5th faculty development workshop put on by the partnership. A 5-day workshop was planned, but winter travel delays in the US required a shorter workshop. A total of 13 researchers took part in the training (7 men and 6 women). Dr. Annie Gjelsvik and Dr. Mike Stein of Brown University were course leaders, and they planned and facilitated the course on-site in Ghana. Drs. Stein and Gjelsvik are both professors who teach at Brown's 6-week on-campus Summer Institute for Clinical and Translational Research. A shortened version of the clinical research course in Ghana allowed the partnership to reach more researchers while keeping costs reasonable. Brown graduate, Dr. Sarah Atunah-Jay participated as a commentator, the past deputy provost of the College of Health Sciences, Prof. Andrew Adjei, also attended the entire workshop.

The 13 participants completed pre-work which was submitted to Drs. Gjelsvik and Stein in the months before the course. This pre-work allowed for the course leaders to understand the research

interests and experience of participants. The course consisted of a mix of lectures, presentations, panels, discussions, group work, peer review, individual meetings with course facilitators, individual writing time, and homework. One key highlight was a panel discussion on research barriers experienced in Ghana by other young investigators, lessons learned, and funding opportunities. The panel members were four Ghanaian researchers who have been supported by the Ghana-Brown partnership, either by being funded by Fogarty AITRP to travel to Brown for the Summer Institute or by receiving developmental grant funding.

The course met its objectives, and by the completion of the course, students understood how to develop and implement a clinical research project. Students left the course with products that will allow them to continue and enhance their research. These products included written aims and hypotheses, an outline of background section, portions of a methods section including eligibility criteria and their sample population, a survey instrument, and an introduction to database software that allows for production of descriptive statistics. In addition, students produced a manuscript Abstract that provided guide posts for next steps beyond the course.

Below is the list of 13 researchers who participated:

- 1) Dr. Frank Boni
 - 2) Dr. Pricilla Nortey
 - 3) Dr. Prudence Nyadezor
 - 4) Mrs. Cecelia Eliason
 - 5) Dr. Eric Sampane-Donkor
 - 6) Dr. Evelyn Bonney
 - 7) Dr. Richmond Aryeetey
 - 8) Dr. Edem Tette
 - 9) Dr. Florence Naab
 - 10) Dr. Patience Anyitei
 - 11) Mr. Alexander Martin Odoom
 - 12) Mr. Philip Debrah
 - 13) Dr. Japheth Awuletey Opintan
- 6) Ethics in Research (May, 2013). On May 16, 2013, the Partnership conducted its final day-long faculty development workshop on the topic of “Ethics in Research.” The training was done in two parts. The first part included presentations that were given by all four facilitators. The participants were then divided into three focal groups, each addressing a case study scenario under the supervision of two facilitators. Each group wrote a brief report on their case study and presented to the other groups. Participants were from the Medical School, Dental School and the School of Allied Health Sciences. They were a total of 37 participants (16 males and 21 females).
- The presentations and breakout sessions were informative and interactive. According to evaluation forms, the majority of participants scored the facilitation between very good and excellent. Many participants indicated that the knowledge gained has enabled them have better insight into topical issues in research ethics. As a result, they were going to put research ethics in a more practical perspective.
- 7) Clinical and transnational research. From May 20 to June 28, 2013, a faculty member from University of Ghana was awarded Fogarty AIDS International Training and Research Program (AITRP) funding to attend Brown's Summer Institute on Clinical and Translational Research. This is a six week Summer Institute at Brown University that covers the fundamentals of clinical research. Taken for-credit at Brown University, the goal of the course was to provide the skills necessary for clinical research and measurement and evaluation. The summer program consists of two full credit courses, Research Methods in Clinical, Translational, and Health Services Research and Scientific Writing, Research Presentation, and Proposal Development.

This training fulfilled the faculty development goal of the partnership but was funded through the NIH Fogarty AITRP (AIDS International Training and Research Program). From May 21 to June 29, 2012, three UG faculty were awarded Fogarty AITRP funding to attend Brown's Summer Institute

on Clinical and Translational Research. This is a six week Summer Institute at Brown University that covers the fundamentals of clinical research. Taken for-credit at Brown University, the goal of the course was to provide the skills necessary for clinical research and measurement and evaluation. The summer program consists of two full credit courses, Research Methods in Clinical, Translational, and Health Services Research and Scientific Writing, Research Presentation, and Proposal Development.

In addition, four faculty members from the University of Ghana and the Kwame Nkrumah University of Science and Technology (KNUST) attended Brown International Advanced Research Institutes (BIARI). The Institute is focused on hands-on faculty development through the development of research projects. Key promising junior faculty from around the globe are chosen through a competitive process. The BIARI is co-directed by one of the partnership's key faculty members, Dr. Susan Cu-Uvin, Director of Global Health at Brown University. Internationally recognized leaders in HIV/AIDS gave lectures during this two week program. Funding for the BIARI comes from an unrestricted grant from the Bank of Santandar. The four faculty members from Ghana were chosen through a competitive process, and were fully supported through BIARI to attend the Institute. Participants included:

- | | |
|-------------------------|----------------------|
| 1) Isabella Amoyaw | 3) Joycelyn Assimeng |
| 2) Joseph Oliver-Commey | 4) Edward Adii bokah |

Dr. Assimeng received additional training from Dr. Elijah Painstil at Yale after the BIARI because of her interest in Pediatric HIV/ID.

List of the participants in the BIARI training:

- | | |
|---|--|
| 1) Dr. Jacob Barnor, Noguchi Memorial Institute for Medical Research, University of Ghana, Accra | 6) Joseph Oliver-CommeyLekma Hospital |
| 2) Dr. Richmond Aryeetey, University of Ghana School of Public Health, University of Ghana, Accra | 7) Joycelyn Assimeng, Korle Bu Teaching Hospital |
| 3) Dr. Anthony Enimil, Komfo Anokye Teaching Hospital, Kumasi | 8) Edward Adii bokah |
| 4) Dr. Betty Norman, Komfo Anokye Teaching Hospital, Kumasi | 9) Dr. Yasmine Hardy, Komfo Anokye Teaching Hospital, Kumasi |
| 5) Isabella Amoyaw, Korle Bu Teaching Hospital | 10) Dr. Amoah Mensah, Korle-Bu Teaching Hospital, Accra |
| | 11) Mr. Nana Ensaw, MPH St. Dominic Hospital, Akwatia |
| | 12) Ms. Martha Abdulai, MPH , Kintampo Research Center |

Participants of the Clinical and Translational Research Course at Brown University:

- | | |
|---------------------------|--------------------|
| 1) Dr. Adwoa Agyei | 4) Peter Puplampu |
| 2) Dr. Timothy Arhpampong | 5) William Kudzi |
| 3) Patrick Adjei | 6) Japheth Opintan |

Appendix D: Other Research Grants and Activities

Chart Review. Natasha Kumar, a Brown undergraduate, traveled to Ghana in July to August. Dr. Flanigan worked with Natasha to set up a project with Dr. Betty Norman, the head of the HIV clinic at the Komfo Anokye Teaching Hospital. Miss Kumar was assisted through the IRB review process at

Brown by Dr. Flanigan, and worked with Dr. Norman to receive IRB approval at Kwame Nkrumah University of Science and Technology in Ghana. Dr. Norman and Miss Kumar's project consisted of a chart review of all new patients entering the HIV clinic for the first time in 2011. Over 4 weeks, Miss Kumar reviewed 1,000 charts.\

Investigation of HIV in post-partum women. In partnership with Dr. Caron Zlotnik from Brown University, Prof. Margaret Lartey, head, Infectious Diseases unit and Dr. Angela Ofori-Atta (the Chief of Mental Health and Psychology at Korle Bu Teaching Hospital and the Colleges of Health Sciences), engaged in a project to understand barriers to long-term engagement to care among women. A particular focus to this project is post-partum women. After pregnancy, women are often burdened with the demands of motherhood and find it difficult to maintain their long-term follow up. This is a significant issue since HIV care requires continued adherence to appointments and medication.

TB Research Elective. Two Brown Medical Students traveled to Ghana in April of 2012 to participate in a TB research elective at the College of Health Sciences, University of Ghana. They worked with Dr. Forson (UG) under the mentorship of Awe Kwara (Brown). The students' names were Nicholas Nassikas and Hsiao, Vivian.

Tuberculosis. A Brown Public Health student traveled to Ghana in the summer of 2013 to work on a collaborative research projects related to the Partnership. Paola Soto, MPH Candidate, worked under the Brown advisors (Dr. Awe Kwara and Dr. Stephen McGarvery) and an advisor from Komfo Anokye teaching Hospital,(Dr. Anthony Enimil) from May 2013 to July 2013 at Komfo Anokye Teaching Hospital on the research topic: "Tuberculosis Treatment Outcomes and Risk Factors for Mortality Among Children Living with HIV in Ghana.

Framework in Global Health grant. A Brown Medical Student, Christine Krueger, received a Framework in Global Health grant to be a research assistant for the research grant awarded to Dr. Asmah (UG) and Dr. Cu-Uvin (Brown) under the HED/USAID grant. Miss Krueger assisted on the project "Molecular Study of Human Papillomavirus Among HIV Positive Ghanaian Women" for 8 weeks from June 10 to August 9, 2013.

Appendix E: Outreach/Extension

- 1) **Infectious Disease Update (June-July, 2011).** From June 27 to July 1, 2011, an update on Infectious Diseases Training Course with a focus on HIV and AIDS was provided to junior members of the Ghana College of Physicians and Surgeons. Three faculty members from Brown joined with three faculty members from the University of Ghana to present lectures and discussions on new developments on the diagnosis and treatment of HIV, TB, hepatitis, MRSA, influenza, and other infections. Thirty-six healthcare professionals from the Ministry of Health and the private sector were trained in HIV/AIDS management. A great interest was noted in the area of HIV and TB and hepatitis. This program provided in-depth lectures and discussions as well as faculty development by modeling state of the art lectures and discussion in partnership between Brown faculty and UG faculty. This update was supported by the Miriam Hospital Infectious Disease division.
- 2) **Medical Knowledge Fiesta 2011.** A national CME conference for practicing physicians in Ghana, the Medical Knowledge Fiesta 2011, took place in Accra from August 1st to 5th, 2011. The theme was "Cutting Edge Updates for Medical Practice in Ghana." The event was organized by the Ghana College of Physicians and Surgeons. It was attended by over 300 physicians with 38 facilitating faculty. The University of Ghana-Brown Academic Partnership to Address HIV/ADS provided

faculty for HIV lectures and a half-day workshop. HIV lectures covered the following topics: 1) “Pediatric HIV in Resource-limited Setting: Successes and Challenges” by Dr. Elijah Paintsil (Yale); and 2) “Current HIV treatment and monitoring guidelines in Ghana” by Dr. Lorna Renner (Ghana). The Workshop on New Trends in HIV Drug Resistance and Therapy was facilitated by Drs. Paintsil and Renner. The HIV sessions were well received and the general expectation is that future CMEs will have sessions dedicated to cover HIV topics.

- 3) **Knowledge FIESTA.** A CME training geared at health care professionals was planned by the partnership for August 8 in Accra, Ghana in collaboration with the National 'Medical Knowledge Fiesta 2012,' planned and chaired by Dr. Elijah Paintsil (Yale). The partnership planned a half-day HIV Update and reached 260 practitioners (157 male, 103 female). The HIV Update was scheduled as the 4th and 5th plenary at the Knowledge Fiesta, hosted at the College of Physicians and Surgeons in Accra. The Knowledge Fiesta was co-sponsored by: Ghana College of Physicians and Surgeons; Ghana Physicians and Surgeons Foundation of North America; Africa Partners Medical; and Korle-Bu Neuroscience Foundation. Three US partnership faculty including Dr. Kwara (Brown), Dr. Paintsil (Yale), and Dr. Monague (Brown) presented on various topics related to HIV, TB, stigma, and elimination of mother-to-child transmission of HIV. The ultimate goal of the event was to provide continuing medication education and to develop UG's capacity to put on high-quality educational seminars.
- 4) **eMTCT symposium.** A national symposium was developed and planned for April 25-26 (with collaboration by NACP, GAC, Ghana Health Services, and the Ministry of Health). At the 'Elimination of mother-to-child transmission of HIV Summit 2012,' we drew stakeholders such as academicians, researchers, practitioners, activists, non-governmental and community-based organizations, policy makers, developmental partners, persons living with HIV and politicians. The 1.5 day Summit addressed successes and challenges in eliminating Pediatric HIV in 2015 in Ghana. Day 1 was a mix of lectures and small groups on various topics. Day 2 was a roundtable discussion to draft a White Paper on the road map to achieve the national goal. A total of 100 people attended the Summit throughout 2 days. (81 participated on the first day, and 72 participated on the second day, with 53 participants attending both days). The VP of Ghana accepted an invitation to attend, and National representatives from the NACP, GAC, UNAIDS and USAID Mission were invited. All stakeholders listed above are involved in planning.
- 5) **Continuing medical education (CME) training - HIV Treatment, Care and Support.** The partnership planned and coordinated in-service continuing medical education (CME) training for health care professionals on January 25-26 in Sunyani, Ghana. In collaboration with the NACP, the partnership organized a two day training with educational sessions for health workers in HIV Treatment, Care and Support for medical officers, physician assistants, nurses, midwives, counselors, pharmacists, pharmacy technicians, biomedical scientists, and data entry staff. The health workers were stratified according to professional groupings and each group had two facilitators who updated them on new developments in their area of work. There was also a session on operational challenges for which the health workers proposed solutions.

Participants were from the 10 regions of Ghana. A total of 178 participants took part in the CME (110 males and 68 females). Facilitators were drawn from the project, the National AIDS Control Program (NACP), Kwame Nkrumah University of Science and Technology (KNUST), and Ghana Health Service.

This CME represented an innovative way of delivering continuous professional development to health workers delivering HIV related services in Ghana. Two afternoons of the three day annual review meeting organized by the National AIDS Control Program (NACP) were dedicated to CPD.

This innovative event also maximized the use of scarce resources, as both the NACP annual review and the CPD (which hitherto would have been held on separate occasions) were successfully run together.

On evaluating the program, participants commended the organizers highly and recommended that this model be applied to other programs that held annual review meetings, i.e. the Malaria Control Program, the TB Control Program, and the Ghana Health Service annual review

- 6) **Continuing medical education (CME) training - New Frontiers in TB Management.** The Partnership organized its final Continuing Medical Education event on the topic of "New Frontiers in TB Management" in collaboration with the National Tuberculosis Control Program. The full-day training was held on May 31, 2012 at the Tamale Teaching Hospital in Tamale, Ghana. The aim was to update health workers on current management of Tuberculosis. A total of 63 participants took part in the CME. This consisted of Doctors/PAs, Pharmacists/Pharmacy Techs, Nurses, Midwives, Counselors, Data Staff-and Biomedical Scientists. Facilitators were drawn from the project, NTCP, Komfo Anokye Teaching Hospital, Korle-Bu Teaching Hospital and Ghana Health Service.

As part of its program, the University of Ghana Brown University AIDS Academic Partnership offers in-service education to health workers, either on its own or in partnership with recognized organizations or programs of the Ghana Health Service. The partnership collaborated with the National Tuberculosis Control Programme (NTCP) in organizing an update on TB management to Health Care Workers in the Northern part of the country. This partnership between the USAID/HED Ghana-Brown Partnership at the NTCP brings in expertise from both sides and also pools funds from both organizations to help reduce cost. It also prevents duplication of functions.

Through this training, health workers attained the level of knowledge and skills required to make an impact on various aspects of the response to tuberculosis and attempts at eliminating pediatric tuberculosis. Educational sessions included updates in TB Treatment, Care and Support for medical officers, physician assistants, nurses, midwives, counselors, pharmacists, pharmacy technicians, biomedical scientists and data entry staff. The update was tailored to their needs with an overall goal to update health workers on new and topical issues relevant to the delivery of improved treatment care and support services to persons diagnosed with Tuberculosis. The CME addressed these objectives using didactic lectures, case based discussions, sharing of experiences and with ample time at the end of each session for questions which was highly interactive.

- 7) **Continuing medical education (CME) training - New Frontiers in TB Management.** In collaboration with the National AIDS Control Program, on Jan. 23-24, the partnership organized a CME event in Kumasi, Ghana. The NACP puts on an annual review meeting for service providers where its activities are reviewed by stakeholders. The partnership recognized the NACP meeting as an opportunity to update service providers on various aspects of HIV/AIDS. The partnership, in collaboration with the NACP, organized 2 days of educational sessions for health workers in New Frontiers in TB Management. The training targeted doctors, physician assistants, nurses, midwives, counselors, pharmacists, and biomedical scientists. A total of 149 participants took part in the CME.

Appendix F: Success Stories

1. ***Ghanaian Health Sciences Interns Explore HIV Patient Care Beyond the Textbook.*** Residents living in rural communities across Ghana receive information about HIV/AIDS and prevention of the disease through basic, often limited resources offered by local hospitals and clinics. In addition, the shortage of well-trained medical professionals who offer proper care to people living with HIV/AIDS remains an ongoing public health challenge.

A multi-faceted partnership between the University of Ghana and Brown University is addressing the obstacles of HIV/AIDS management in Ghana through educational offerings, training, research, and community engagement.

Among their strategies, partners implemented a six-week program that allows talented students at UG the opportunity to intern at nearby rural hospitals. While there, the students receive hands-on experience and learn practical approaches to responding to the needs of people living with HIV/AIDS, whose conditions can be further complicated when they also suffer from illnesses such as malaria, tuberculosis, hypertension, and malnutrition.



From left to right: University of Ghana student Mabel Torku, head nurse Sister Mary Magdalene Arthur-Mensah, University of Ghana student Sylvia Takyi, and Rev. Father Augustine Essel pictured on the grounds of the Apam Catholic Hospital. Photo by Awewura Kwara, Brown University

UG students Mabel Torku and Sylvia Takyi participated in the program, serving as interns at Apam Catholic Hospital in the areas of nursing and dietary care, respectively. “When they first come, they have fears. They are shy,” said Rev. Father Augustine Essel, head of the hospital’s HIV unit. “After, they see how we are and they are relaxed.”

Through the University of Ghana-Brown University partnership, Torku, a nurse of 18 years, first learned how to care for HIV patients. “I have never come to learn about an HIV person until now,” said Torku. “I had the opportunity to put smiles on people’s faces. When you come to rural areas you realize how much they need you.”

For Takyi, the program opened her eyes to patients with diseases she had not seen in the city. “It made me read a lot and made me conscious of other things that I had not seen before. Things that were not taught in class, I had to learn them before getting into class.” When Takyi observed patients consuming food brought in from vendors outside the hospital, she alerted staff and took action, designing a hospital menu, which was quickly put in place. By the end of her internship, Takyi was asked to serve as a hospital dietician.

The expansion of students’ health care skills is a direct result of new experiences gained at rural hospitals that benefit the hospital staff, the interns, and ultimately, the patients.

- University of Ghana’s College of Health Sciences preparing students for the realities of the workforce.*** University of Ghana’s College of Health Sciences maintains a roster of talented lecturers across its schools. With the task of preparing students for the realities of the workforce, the University of Ghana’s administrators sought opportunities to bolster the quality of education it provides to today’s HIV/AIDS educators and health care workers.

Gladys Dzansi, an assistant lecturer at the School of Nursing, knew the path to advancement in her studies and career would require obtaining her doctorate, but finding an affordable school with the program she wanted was a challenge. “We don’t have a PhD nursing program in Ghana and the university requires that as a faculty member, you should have a PhD to keep your appointment with the university”, says Dzansi, “It became necessary for me to look for schools.”

Dzansi, a clinical supervisor of six years and lecturer for three years, applied for a Brown Fogarty AIDS International Training and Research Program (AITRP) scholarship funded by an NIH training grant, in collaboration with the Brown - Ghana partnership. Dzansi was one of three lecturers supported by the Ghana-Brown partnership and Fogarty AITRP to enroll in long-term training. She will attend a “sandwich” program at the Western Cape University in South Africa, where she will spend three months a year. During the other months of the year, Dzansi will take online courses through Western Cape University while continuing her faculty duties at the University of Ghana.

Although the opportunity to earn her PhD will require being away from her son during her studies in South Africa, Dzansi is confident that her research in the use of mobile phones to improve treatment can improve the lives of people living with HIV and support Ghana’s health care system. “I recognized that despite the availability of drugs, people still have problems with quality of life,” says Dzansi.

Dzansi is a promising prospect for University of Ghana’s sustainability. She is already a member of the partnership committee working on revising UG’s School of Nursing curriculum, and is willing to do more upon completion of her degree. Dzansi mentors her fellow faculty members as well as students who are in pre-service training that includes HIV health care, and through her interactions with nursing students, she brings sound instruction with an enthusiasm that motivates her students. “She is such a devoted lecturer. No matter what time of day, she is there for you,” said Mabel Torqu, a University of Ghana nursing student. “She is so interested in helping people; she is an asset.” Dzansi is thankful for the opportunity to progress in her career, mentoring from the Brown, Tufts, and UG partnership faculty, and encouragement from the administration and the College of Health Sciences.

- 3. *UG faculty and students trained in ULTRA.*** Before the implementation of the University of Ghana College of Health Sciences Learning and Teaching Resource Application (ULTRA), there was no knowledge management system at the College of Health Sciences that could be used to facilitate the creation, sharing, and leveraging of information to support health sciences education and training using open source technology.

Over a two year period, the University of Ghana-Brown University Academic Partnership to Address HIV/AIDS in Ghana has worked diligently to bring ULTRA to the College of Health Sciences (CHS). Tufts and University of Ghana (UG) IT staff worked together to procure servers and other hardware, install software, and troubleshoot as installation challenges arose. The UG and Tufts staff were in constant contact throughout this period. Additionally, the partnership trained two key UG IT staff responsible for ULTRA in January 2012. Wisdom Dzikunu and Chris Yebuah trained for a week in Boston, and their in-depth training was a key step for successful installation of ULTRA at UG, as they later trained other UG personnel in the system.

In November of 2012, the UG-Brown Partnership organized three days of ULTRA trainings, which coincided with a faculty development workshop on Medical Education and meetings with key UG leadership to ensure the success of ULTRA. The November Medical Education workshop and ULTRA trainings were planned together because these activities are synergistic and support each other. The November faculty workshop tackled topics that were relevant and meaningful to the use of ULTRA at UG, including strategies for integrating electronic media in health professional

education, open education resources, and the use of ULTRA as an HIV knowledge repository. Together with trainings on how to use ULTRA for course management, these activities familiarized faculty from UG, Kwame Nkrumah University of Sciences and Technology, Valley View University, and University for Development Studies (Tamale) with relevant issues related to online education resources.

Dr. Susan Albright, Director of Educational Technologies at Tufts University, also used this November trip to Ghana to meet with the Deans and Directors of the College of Health Sciences schools. Present at the meeting were the deans of Schools of Pharmacy, Dentistry, and Allied Health Sciences as well as the college administrative heads. This meeting was aimed at familiarizing the college leadership to ULTRA while gaining further buy-in to ensure sustainability and ownership. Prof. Aaron Lawson, the Provost of CHS, gave a short welcome address and explained to the deans the purpose for Dr. Susan Albright's visit. Dr. Albright gave a presentation on the uses of ULTRA, followed by discussions on how the various schools can adopt this system. This meeting was a key step in continuing to engage college leadership in ULTRA and its sustainability in the coming years.

A huge success for the partnership related to ULTRA implementation at UG has been the extensive faculty, administrative, and student workshops and training sessions. Over a period of six months, a total of 165 faculty, IT staff, librarians, students, and other UG personnel were trained in using ULTRA. Dr. Albright ran the first ULTRA training session in November, and Mr. Yebuah and Mr. Dzikunu led the training sessions in January 2012/February 2013 and March 2013. Each training was geared towards the needs of different ULTRA users and support staff. IT personnel from the university (programmers and technicians), staff (mostly the schools librarians who will be assisting faculty and students with the system), and faculty identified as early adopters learned how to use ULTRA and its tools, including: log-in and site navigation, course creation, uploading and editing course content (text, video, audio, powerpoint), and creating/completing quizzes and assignments.

“A very interesting and educative program where I have learned how to retrieve educational information from ULTRA. I think it will be very much helpful to me and other college students.” ~ ULTRA training participant”

There are several important next steps that the partnership is preparing for now that ULTRA trainings have been successfully implemented. First, the partnership developed modules on HIV-related topics that will be uploaded onto ULTRA as original content, and used as a resource by UG faculty teaching these subjects. US and UG faculty and clinicians have partnered to create PowerPoints on relevant topics including: Antiretroviral therapy, HIV and opportunistic infections, preventing mother-to-child transmission of HIV, TB/HIV, and pediatric HIV. Second, the partnership is in the process of planning an ULTRA launch, at which key stakeholders will be invited to witness the launch of the online system. The event will create excitement around ULTRA, which will encourage its use on campus by faculty and students. Lastly, the partnership plans to provide open access to all students and staff of the College of Health Sciences.

All of these activities related to ULTRA at UG, from installing the system to training 165 staff to ensuing buy-in from key leadership, has been a significant success for the partnership. While there is still work to be done in creating relevant content for the system, the partnership has diligently created a solid base for future activities.

- 4. Nurses and HIV counselors take on the challenge of managing adolescents.** The successful administration of antiretroviral therapy and other interventions has resulted in longer survival of HIV infected children in Ghana and as the children turn 12 years they are transferred from pediatric to adult clinics. Ghana has no practicing adolescent physicians and adolescents are

managed by adult physicians.

HIV nurses and counselors in the adult clinic suddenly found adolescents thrust upon them and more often than not had no clue as to how to proceed with the many challenges that adolescents bring. It was therefore not surprising that this category of health workers greeted with applause the news that the continuous medical education was going to be on sharing lessons and best practices in managing adolescents. This was at the yearly annual HIV review meeting of the National AIDS Control Program in partnership with the UG-Brown University AIDS Academic Partnership managed by Higher Education for Development and funded by USAID. This was the second in the series of innovative partnerships to offer CMEs to practicing health workers. Held on January 23-24, 2013 this CME event in Kumasi was an opportunity to update service providers including nurses, physician assistants, doctors, and pharmacists on various aspects of HIV/AIDS. A total of 153 individuals participated in educational sessions on topics related to HIV treatment, care, and support.

The sessions had presentations which included case studies. Presentations were given on topics including 'New Guidelines in Preventing Mother-to-Child Transmission (PMTCT): Breast feeding and Early Infant Diagnosis (EID),' and 'Operational Issues in PMTCT Effective follow-up of mother/baby pair).' Discussions on 'Lessons on Handling Adolescents' were participatory and covered sexuality, adherence, stigma, discrimination, disclosure, fertility intentions, and relationships. Some major lessons were on improved adolescent tailored counseling techniques and focus on adolescent health care. The lessons and experiences shared were so gripping that the session run beyond its allocated time. There was so much to learn and participants wanted a repeat session.

In response to the question, "how do you think knowledge gained will impact your current work?" seventeen of the participants stated that: "This will improve my service delivery and make it easier to handle adolescents." Other responses included: "Knowledge acquired would be imparted to colleagues." Of those who completed the evaluation, 50% ranked the session as very good and another 50% as excellent. It is therefore no exaggeration to say that these health workers left the workshop ready to take on the challenges of managing HIV infected adolescents to the best of their ability.

Appendix G: University of Ghana/Brown University Report



**Very Higher Education for Development
Knowledge, Partnerships, Results**

Institutional Partnerships Program

**Final Partnership Report for the
University of Ghana-Brown University Academic Partnership
to Address HIV/AIDS in Ghana**

July 1, 2011 – June 30, 2013

PARTNERSHIP OVERVIEW

Partner Institutions:

Brown University; University of Ghana

Additional partners:

The Miriam Hospital, Tufts University, Yale University.

Region:

Sub-Saharan Africa

Dates:

July 2011 to June 2013

Funding Level:

\$1,100,000

**Proposed
Cost Share:**

\$207,195

Partnership Context and Objectives

Purpose

To enhance the capacity of the University of Ghana in its educational programs, research, and community engagement that will result in improved response to HIV/AIDS challenges in Ghana.

Overview

The Ghana – Brown Partnership fostered activities and training focused on addressing the low capacity of the University of Ghana College of Health Sciences to train a multidisciplinary health workforce to deal with the public health challenges of HIV/AIDS in Ghana and Africa. Partnership activities included academic curriculum development, faculty development, continuing medical education, and institutional capacity building. The program served students, doctors, university faculty, researchers, and health workers resulting in enhanced capacity for HIV/AIDS management in Ghana.

The partnership, which also involved Yale and Tufts Universities, was funded by a grant from the United States Agency for International Development as part of the Higher Education for Development program.

HIV/AIDS in Ghana

Although the HIV/AIDS epidemic in Ghana is considered a low-level, generalized epidemic, some sub-populations have very high infection rates. Further, only about 36 percent of infected persons are receiving treatment. A high co-morbidity rate of tuberculosis among the HIV-positive population compounds the problem.

The care gap for people with HIV in Ghana is largely due to human resources shortages. Poor working conditions, low pay, lack of career development, and a shortage of medicine, information, and essential tools fuel the “brain drain” of professionals to other countries. This partnership addressed the care gap by enhancing the capacity of the University of Ghana in its educational programs, research, and community engagement that will result in improved response to HIV/AIDS challenges in Ghana.

Goals and Vision

The partnership between University of Ghana (UG) College of Health Sciences (CHS) and Brown, Tufts, and Yale Universities fostered collaboration, leveraged funding, trained a multidisciplinary healthcare workforce with a focus on enhancing the response to HIV/AIDS challenges in Ghana.

This partnership had a 10-year vision to develop human resource capacity with a full set of skills to meet challenges related to the HIV/AIDS epidemic in Ghana. The twinning of African and United States (US) institutions supported by USAID and Higher Education for Development (HED) Africa-U.S. Higher Education Initiative provided an opportunity for shared learning, enhanced capacity building, empowered the partner institutions to contribute more effectively to African development and transformation, and promoted USAID's regional goals.

The strength of our US academic partners includes teaching, research, and innovation in program development, especially in response to the HIV/AIDS epidemic. The strength of UG is first-hand knowledge of the cultural context and real life problems challenging national development and its role as a national and regional leader.

This grant I established a National Educational Center of Excellence in HIV/AIDS at UG that will continue to serve the broader healthcare communities of Ghana. The partnership activities supported USAID's country goals by addressing work-force capacity needs to strengthen and expand programs for HIV/AIDS care and prevention including services for the most-at-risk population (MARP).

Objectives

1. Curriculum Development: Improve academic programs in HIV/AIDS resulting in pre-service training for a skilled multidisciplinary workforce responsive to HIV/AIDS treatment, and prevention strategies in Ghana.
2. Faculty Development: Develop excellence in education and research by strengthening faculty capacity at UG resulting in enhanced teaching, and applied research to effectively address challenges of HIV/AIDS in Ghana.
3. Continuing Medical Education: Enhance competencies of healthcare professionals in Ghana through continuous and distance education resulting in enhanced capacity of HIV/AIDS management.
4. Institutional Capacity Building: Build institutional capacity of the UG resulting in better coordination of education and research and improved provision of community services in Ghana.

Collaborating Stakeholders

The Partnership worked with key stakeholders, including national agencies, community organizations, and other higher education institutions in Ghana.

National agencies including the National AIDS/STI Control Program, the Ghana AIDS Commission, the Ministry of Health, and the Ghana Health Service were key partners in many activities, including pre-service and in-service curriculum development, CME trainings, and planning the national symposium. The general stakeholder support of these government agencies also lent to the overall success of the partnership, and we look forward to continuing collaboration.

The partnership also engaged with district hospitals (Apam Hospital, St. Dominic Hospital in Akwatia, Agona Sewdru Government Hospital, Kade Hospital, Winneba Hospital, and Asamankese Hospital) in community attachment programs by placing students at these locations. These collaborations with district hospitals were beneficial to both students and communities; students received training and practical experience working in these settings, and the hospitals also gained from hosting dedicated students who will soon be providing care to communities.

The partnership also engaged other higher education institutions and associated teaching hospitals in Ghana in program activities. Kwame Nkrumah University of Science and Technology, School of Medical Sciences (KNUST) and Komfo Anokye Teaching Hospital were engaged in the CME in Sunyani, Ghana. The Korle-Bu Teaching hospital associated with the University of Ghana, College of Health Sciences has also been involved, specifically in research activities related to the partnership. Also engaged in faculty development workshops were Valley View University and the University of Development Studies in Tamale and the University of Cape Coast.

PARTNERSHIP RESULTS

Key Achievements and Major Outputs

Within the first objective, the Brown-Ghana partnership engaged in several major activities to improve pre-service training at UG.

Curriculum Development

Beginning in the first year of the partnership, program staff, in collaboration with faculty and administrators at each of the University of Ghana College of Health Sciences schools, worked to create and conduct a baseline assessment of UG programs and faculty needs. Each school created a curriculum development “School Group” and designated a leader to take ownership of the curricular development assessment and activities. In all, about 36 faculty members from all seven CHS schools were engaged in school working groups. Each School Group convened several times during the two years of the partnership. In addition, Brown, Yale, and UG personnel worked with faculty from each of the schools in the curriculum development process.

These School Groups, working collaboratively with U.S. faculty, were tasked with reviewing the current curriculum at the Schools of Nursing, Medicine, Allied Health Sciences, and Public Health at the Univ. of Ghana College of Health Sciences. To begin this process, a curriculum review process document was created by a Brown faculty member, and was circulated and used to guide review. Next, core competency documents were created by each of the schools, and a cross-reference document was created to outline overlap in HIV content. Using the curriculum “core competency” model, representatives from the Schools of Medicine, Nursing, Public Health, and Allied Health Sciences (Dietetics and Medical Lab Sciences) reviewed and finalized core competencies for a comprehensive HIV/AIDS curriculum. Each of the four targeted schools reviewed existing courses that addressed HIV/AIDS and proposed new topics and courses that would be relevant. Courses in which HIV content was or could be taught were identified, and responsible faculty and available resources were also identified. The partnership invited stakeholders including representatives from the National AIDS Control Program to receive outside stakeholder input about the curriculum.

This curriculum review led to development of content including lectures, materials, and hand-outs that addressed the gaps in core competencies that were identified. The four UG schools involved in curriculum development were tasked with gathering HIV materials currently being used to better identify needs and gaps. By identifying what materials they had in the respective departments and divisions, the schools hoped to enhance content available across the schools. Ultimately, UG and Brown developed near-term and longer-term goals for curriculum development. Because significant changes to the curriculum require university approval, some of these goals are longer term and were not completed by the partnership end-date. Near-term goals looked at enhancements that could be made to existing courses for upcoming semesters.

As the partnership prepared to develop pre-service lectures and materials, another major activity was the creation of an HIV/AIDS materials library. The Brown Program Coordinator gathered materials from key faculty at Brown, Tufts, and Yale, and the UG Program Coordinator worked to file lectures from UG. Brown personnel also reviewed other available resources (such as iTech and the Uganda Academic Alliance) that may be useful as ULTRA continues to develop content. Gathering these relevant lectures, talks, and materials were useful for UG’s curriculum

enhancement, because the inventory helps to define core principles in HIV/AIDS, and can be updated and used in the future.

One of the near-term goals that the Partnership completed was the development of new content for ULTRA. The partnership developed 5 modules on HIV-related topics that were uploaded onto ULTRA as original content, and used as a resource by UG faculty teaching these subjects. U.S. and UG faculty and clinicians partnered to create PowerPoints that included several Ghana-specific case studies. The 5 topics are: Antiretroviral therapy, HIV and opportunistic infections, preventing mother-to-child transmission of HIV, TB/HIV, and pediatric HIV. This activity meets the curriculum development objective to develop lectures and materials for 5 topics in year 2.

Student Seminars

Also to address short-term goals of educating student currently enrolled in courses at UG CHS, the School Groups discussed the need for cross-school seminars to address the short term priority competency gaps that exist across schools (i.e. stigma). The partnership organized college-wide student seminar on various topics. An outcome of the curriculum review process, the seminar series addresses topic gaps identified in the student curriculum. The half-day seminars are made available and advertised to all students from the six schools namely Nursing, Pharmacy, Medicine, Dentistry, Allied Health Sciences, and Public Health. The Partnership took the opportunity to provide seminars available to all CHS students, and organized four Student Seminars on topics that were an identified need. In the two years of the grant, the partnership organized four student seminars, reaching 416 students.

HIV and Stigma and HIV and Law: October 18, 2012

The partnership sponsored its first half-day college-wide student seminar, an HIV/AIDS update, on October 18, 2012. This seminar covered the following topics: HIV and the law, stigma and discrimination in health care settings, the impact of stigma and discrimination on HIV care, and violence and discrimination against most-at-risk persons. Speakers included: Dr Bernard Dornoo (National AIDS/STI Control Program), Dr. Ernest Kenu (Korle-Bu Teaching Hospital), and Chief Jones Blantari (Ghana Police Service). A student presentation was also featured, and a nursing student presented on her research topic "To Tell or Not to Tell: The Dilemma of People Living with HIV/AIDS in Dzodze, the Volta Region." Participants were from all the six schools of the college and the research institute. There were a total of forty-seven students, with 28 males and 19 females in the class.

HIV and Mental Health: January 17, 2013

The partnership hosted its second half-day college-wide student seminar on January 17, 2013 at UGMS on the topic of Mental Health and HIV/AIDS. This seminar covered the following topics: neurobiology of HIV, neurological manifestations of HIV, psychiatry manifestation of HIV, HIV disclosure and mental health, HIV related stigma and mental health. Speakers came from the UGMS Departments of Medicine/Therapeutics and Psychiatry. A special feature was a talk given by a person living with HIV/AIDS, who shared her personal experience with emphasis on how she dealt with disclosure and stigma. Participants were from all the five schools of the college. There were a total of 86 participants, with 55 males and 31 females. The discussion sessions were lively and interactive. From the completed evaluations, most participants felt the content was very good and found the presentations very useful. The majority of participants thought that this seminar will impact their work by encouraging avoidance of stigmatization. The participants highly recommended that the seminar should be organized frequently.

Interdisciplinary practice: February 28, 2013

The next student seminar in the series was on the topic "Education in the Health Professions: Contemporary Issues." The third half-day seminar, held from 12:30-4:30pm on February 28, was organized to expose students to some contemporary education methods and to assist students to improve on learning. Presentations were given on curriculum in the College of Health Sciences, how adults learn, and introduction to Inter-professional Education (IPE). The seminar was open to students from all College of Health Sciences schools, but drew mostly Public Health and Nursing students. There were a total of 208 students in attendance, with 87 males and 121 females.

HIV and Adherence: March 27, 2013

The fourth college-wide student seminar was held on Wednesday, March 27 on the topic of Adherence to Medications. The session lasted 2 hours and was held at the School of Nursing. This seminar was organized to expose students to Adherence to medication. Lecturers from the Schools of Public Health and Pharmacy gave presentations on adherence to antiretrovirals and other medications for adults and children. Participants were mostly from the School of Pharmacy and School of Nursing. There were a total of 75 students attending (31 males and 44 females).

ULTRA Installation and Training

Before the implementation of the University of Ghana College of Health Sciences Learning and Teaching Resource Application (ULTRA), the college had implemented an open education resource with Michigan University which involved the recording of practical sessions for students to view in their own free time. There was very limited knowledge management system at the College of Health Sciences that could be used to facilitate the creation, sharing, and leveraging of information to support health sciences education and training using open source technology.

Over a two year period, the University of Ghana-Brown University Academic Partnership to Address HIV/AIDS in Ghana has worked diligently to bring ULTRA to the College of Health Sciences (CHS). Tufts and University of Ghana (UG) IT staff worked together to procure servers and other hardware, install software, and troubleshoot as installation challenged arose. The UG and Tufts staff were in constant contact throughout this period. Additionally, the partnership trained two key UG IT staff responsible for ULTRA in January 2012. Wisdom Dzikunu and Chris Yebuah trained for a week in Boston, and their in-depth training was a key step for successful installation of ULTRA at UG, as they later trained other UG personnel in the system.

Dr. Susan Albright, Director of Educational Technologies at Tufts University, traveled to Ghana in November 2012 to meet with the Deans and Directors of the College of Health Sciences schools. Present at the meeting were the deans of Schools of Pharmacy, Dentistry, and Allied Health Sciences as well as the college administrative heads. This meeting was aimed at familiarizing the college leadership to ULTRA while gaining further buy-in to ensure sustainability and ownership. Prof. Aaron Lawson, the Provost of CHS, gave a short welcome address and explained to the deans the purpose for Dr. Susan Albright's visit. Dr. Albright gave a presentation on the uses of ULTRA, followed by discussions on how the various schools can adopt this system. This meeting was a key step in continuing to engage college leadership in ULTRA and its sustainability in the coming years.

A huge success for the partnership related to ULTRA implementation at UG has been the extensive faculty, administrative, and student workshops and training sessions. Over a period of

six months, a total of 165 faculty, IT staff, librarians, students, and other UG personnel were trained in using ULTRA. Dr. Albright ran the first ULTRA training session in November, and Mr. Yebuah and Mr. Dzikunu led the training sessions in January 2012/February 2013 and March 2013. Each training was geared towards the needs of different ULTRA users and support staff. IT personnel from the university (programmers and technicians), staff (mostly the schools librarians who will be assisting faculty and students with the system), and faculty identified as early adopters learned how to use ULTRA and its tools, including: log-in and site navigation, course creation, uploading and editing course content (text, video, audio, PowerPoint), and creating/completing quizzes and assignments.

There are some important next steps that the partnership is preparing for now that ULTRA trainings have been successfully implemented. First, the partnership developed modules on HIV-related topics that will be uploaded onto ULTRA as original content, and used as a resource by UG faculty teaching these subjects. U.S. and UG faculty and clinicians have partnered to create PowerPoints on relevant topics including: Antiretroviral therapy, HIV and opportunistic infections, preventing mother-to-child transmission of HIV, TB/HIV, and pediatric HIV. Secondly, the partnership plans to provide open access to all students and staff of the College of Health Sciences.

All of these activities related to ULTRA at UG, from installing the system to training 165 staff to ensuing buy-in from key leadership, have been a significant success for the partnership. While there is still work to be done in creating relevant content for the system, the partnership has diligently created a solid base for future activities.

Community Attachments

The Ghana-Brown partnership seeks to enhance pre-service training by sending students to communities in Ghana as part of the community attachment program. The program has the following 4 objectives for students: participate in HIV/AIDS activities being offered at the site; observe the roles of health workers for critical review; observe and study the chain of supply relevant to tasks performed; and offer suggestions on how HIV education can be improved in schools based on community experience. The community attachments ran for a period of between 3 to 6 weeks each.

To implement the program, partnership staff visited possible community attachment sights to identify and select three new sites for the second year of the program. In year one, the partnership used three ART sites (Apam Catholic Hospital, St. Dominic Catholic Hospital, and Asamankese Hospital). For year two, three other hospitals (Agona-Swedru District Hospital, Winneba District Hospital, and Kade District Hospital) were visited and selected to serve as attachment sites. The UG Partnership office advertised the program to CHS students, and also oversaw the student selection and placement process. UG staff also conducted site visits during the program.

Over a two year period, eighteen students were selected to participate in the Community Attachment Program, and seventeen completed their attachments. Students completed attachments at seven district hospitals: Apam Catholic Hospital, St. Dominic Hospital in Akwatia, Asamankese Hospital, Agona Sewdru Government Hospital, Kade Hospital, and Winneba Municipal Hospital. The students chosen represent four UG CHS schools (Nursing, Allied Health Sciences, Pharmacy, and Medical School).

Here is a list of the community attachment participants who completed their 3 to 6 week program:

1. Mr. Mumuni Iddris – School of Nursing (SON), (Akwatia)
2. Mr. Haruna Taufique – School of Allied Health Sciences (SAHS), (Akwatia)
3. Ms. Sylvia Abena Takyi– SAHS (Apam)
4. Mrs Mabel Torqu – SON (Apam)
5. Mr. Ebenezer Anobu Otu – UG Medical School (UGMS), (Asamankese)
6. Mr. Benjamin Awuku-Fremont – UGMS (Asamankese)
7. Mr. Benedict Ewusi Dadzie – UGMS (Agona Swedru Government Hospital)
8. Mr. Samuel Oppong – Pharmacy (Agona Swedru Municipal Hospital)
9. Mr. Pars Daniel Annan – Pharmacy (Winneba Municipal Hospital)
10. Ms. Elisha Asomaning Amponsah – Pharmacy (Winneba Municipal Hospital)
11. Mr. Ebenezer Adu Nyarko – Pharmacy (Kade Government Hospital)
12. Mr. Kwabena Nkansah Asante - (Pharmacy) Nyarko – Pharmacy (Kade Government Hospital)
13. Mr. Peter Paul Anekor – School of Public Health (Asamankese Government Hospital)
14. Ms. Francisca Nana-Aba Mccarthy – SAHS (Apam)
15. Ms. Dinah Lamptey – Pharmacy (Apam)
16. Ms. Priscilla Akua Bamfoa Botchway – SAHS (St. Dominic’s Hospital)
17. Ms. Sena Ahiakpah – Public Health (St. Dominic’s Hospital)

The student community attachments were extremely successful, in part because they reached students not only training in medicine, but also nursing, nutrition, pharmacy, public health and lab sciences. While these types of programs are usually geared toward medical students, the participation of students in other disciplines can be extremely helpful to meet the needs of these sites and communities. For example, the UG student studying nutrition was able to aid the site in developing nutritional guidelines.

Community Attachment Sites and Duties

The students in Kade worked with the health management team and went on rotation to the various departments: dispensary, the public health centre, the voluntary counseling and testing unit, the adherence counseling unit, and the consultation unit. Activities that the students participated in included: assisting the hospital pharmacist to learn prescription editing, dispensing of medication, filling of national health insurance claim forms, patient counseling, pre-packing of medicines, and stock checking and preparation of stock reports. Also important, the students were involved in giving talks dubbed "Kill the stigma now" in some basic schools, which emphasized the need for people to stop discriminating against people living with HIV/AIDS.

In Winneba, the students assisted at the counseling unit and had the opportunity to interact with Models of Hope, an organization of people living with HIV/AIDS who are trained to counsel HIV patients (especially the newly diagnosed and defaulters). Most days were spent helping out at the pharmacy prepackaging drugs, filling prescriptions, and dispensing pharmacy prepackaging drugs, filling prescriptions, and dispensing medicines. The students also helped to review prescriptions and counsel patients in the use of their medications. Additionally, there was a weekly tutorial for staff of the hospital, and the students had the opportunity to present on the topic "Antibiotic Resistance."

The students at St. Dominic's hospital assisted at the HIV clinic by registering patients, checking vital signs, counseling new clients, giving talks on drug adherence, collecting data for the quality assurance survey of the hospital, administering drugs to patients, and assisting Dr. Ensam (Public Health Unit) during ward rounds at the Fevers? Unit. One of the students also

worked at the radiography department. Outreach activities were organized to neighboring villages where antenatal and postnatal care, child welfare clinic, school health, and home care services were offered. Most of the inhabitants of these villages cannot come to the hospital for care for various reasons. Four "Health Talks" were organized during the period of attachment, and topics covered personal hygiene, healthy living, vaginal candidiasis, and teenage pregnancy. In Apam, the students helped in the packing of medicines for the patients, and familiarizing themselves with the software programs used by the dispensary and the HIV clinic. They had the opportunity to visit the central stores in Cape Coast and to bring the ARVs needed by the clinic. The students also gave a talk at the clinic on the importance of adherence to drugs and the importance of good nutrition

At Swedru, the students were under the supervision of the medical superintendent, Dr. Dzodzegbe. The students had the opportunity to go to the wards every morning with Dr. Dzodzegbe to observe the way he examines and reviews the patients on admission. The students also went to the theater with him after rounds to observe him carry out cesarean sections, hysterectomy, myomectomy and laparotomy, and manage patients with post-partum hemorrhage. At the ART clinic, students recorded patients' vitals and had counseling sessions with patients, advising them on living healthily with their condition and preventing transmission to others. At the pharmacy, the basic activities undertaken were stock taking of supplies, packaging, and dispensing of drugs from written prescriptions. The students also spent some time at the family planning and reproductive health center and the chest clinic.

At Asamankese, the students participated in activities at the ART clinic where patients are first counseled at the out-patient department before they are put on ART. The students also gave talks at some schools to create awareness on HIV/AIDS prevention.

Within the second objective, the partnership has taken part in many major activities to strengthen UG faculty capacity.

Faculty Development Workshops

As part of the second objective of faculty development, the Partnership put on a workshop series that covered topics identified at UG at high priority. Over two years, the Partnership conducted six workshops lasting from a half-day to four days, and reaching about 217 participants.

HIV-related Clinical Research: Behavioral and Biomedical Advances (September, 2011)

The partnership coordinated a half-day UG faculty development workshop entitled "HIV-related Clinical Research: Behavioral and Biomedical Advances." Nineteen faculty members from five UG College of Health Sciences schools and from the Noguchi Memorial Institute for Medical Research attended this workshop at the Ghana College of Physicians Conference Center on September 20, 2011. Seven faculty from Brown, Yale, and UG gave 30 minute lectures on topics including: overview and tips for developmental grants, ethics, qualitative and quantitative research methods, and HIV/AIDS in marginalized populations. The development workshop was well received, according to evaluations from participants.

Statistics (November, 2011)

The partnership's second faculty development workshop was held on November 23, 2011 on the topic of statistics. It included hands-on training, and trained 43 participants (19 female and 24 males). The sessions were lively and interactive, receiving positive evaluations at the end of the training. At the end of the training, participants were able to (using secondary data) create spreadsheets, enter data and run simple analysis. Simple analysis such as frequencies, cross tabulation, determination of chi square values, confidence interval comparing means using T-test, ANOVA and simple binary regression.

Grant Proposal Writing (February 2012)

The partnership's third faculty development workshop was on the topic of grant proposal writing. It drew 40 participants, including 17 males and 23 females. This workshop was held in two sessions. The first session was theory where five presentations were made on Understanding the Grant Proposal Writing Process, Problem statement, Introduction & Literature Review, Aims, objectives and methodology, and Ethical consideration and institutional review. The second session was held in the afternoon and it comprised of hands-on training to put the principles learnt during the morning session to practice.

Medical Education (November, 2013)

The fourth workshop, which took place on November 15-16, 2012, was under the theme of Medical Education. The workshop consisted of presentations, panel discussion sessions, and small group sessions. Dr. Julie Taylor (Brown), Dr. Kathy Takayama (Brown), Dr. Brian Montague (Brown), and Dr. Susan Albright (Tufts) traveled from the US to present on special topics. Speakers from UG included: Prof. Margaret Lartey, Dr. Akye Essuman, Prof. J.K. Acquaye, Dr Akye Essuman, Mr. Chris Yebuah, and Dr. S.Y. Oppong.

Over the two day period, presentations and discussions were held on the following topics: how people learn; integrating electronic media into health professional education; evaluation in health professional education; clinical exposures and integrating human story into medical education; open education initiatives; developing inter-professional education in Ghana; e-learning; and developing cross-program and interdisciplinary education. Participants for this workshop were faculty from the University of Ghana College of Health Sciences, Kwame Nkrumah University of Sciences and Technology, Valley View University, and University for Development Studies in Tamale. A total of sixty-five faculty attended (37 males and 28 females). From the participant evaluations, most faculty were very satisfied with the overall meeting quality. Most of the participants considered "new tools of learning, teaching, and evaluation of programs" and "team-based learning" as the most important things they learned from this workshop.

Developing Clinical Research Projects (February, 2013)

The Ghana-Brown partnership put on a 4-day faculty development workshop on the topic of development clinical research projects. This workshop, which took place on February 12-15, 2013 in Koforidua, Ghana, is the 5th faculty development workshop put on by the partnership. A 5-day workshop was planned, but winter travel delays in the US required a shorter workshop. A total of 13 researchers took part in the training (7 men and 6 women).

Dr. Annie Gjelsvik and Dr. Mike Stein of Brown University were course leaders, and they planned and facilitated the course on-site in Ghana. Drs. Stein and Gjelsvik are both professors who teach at Brown's 6-week on-campus Summer Institute for Clinical and Translational Research. A shortened version of the clinical research course in Ghana allowed the partnership to reach more researchers while keeping costs reasonable. Brown graduate, Dr. Sarah Atunah-Jay participated as a commentator, the past deputy provost of the College of Health Sciences, Prof. Andrew Adjei, also attended the entire workshop.

The 13 participants completed pre-work which was submitted to Drs. Gjelsvik and Stein in the months before the course. This pre-work allowed for the course leaders to understand the research interests and experience of participants. The course consisted of a mix of lectures, presentations, panels, discussions, group work, peer review, individual meetings with course facilitators, individual writing time, and homework. One key highlight was a panel discussion on research barriers experienced in Ghana by other young investigators, lessons learned, and funding opportunities. The panel members were four Ghanaian researchers who have been supported by the Ghana-Brown partnership, either by being funded by Fogarty AITRP to travel to Brown for the Summer Institute or by receiving developmental grant funding.

The course met its objectives, and by the completion of the course, students understood how to develop and implement a clinical research project. Students left the course with products what will allow them to continue and enhance their research. These products included written aims and hypotheses, an outline of background section, portions of a methods section including eligibility criteria and their sample population, a survey instrument, and an introduction to database software that allows for production of descriptive statistics. In addition, students produced a manuscript Abstract that provided guide posts for next steps beyond the course. See below for the list of 13 researchers who participated:

- 1) Dr. Frank Boni
- 2) Dr. Pricilla Nortey
- 3) Dr. Prudence Nyadezor
- 4) Mrs. Cecelia Eliason
- 5) Dr. Eric Sampane-Donkor
- 6) Dr. Evelyn Bonney
- 7) Dr. Richmond Aryeetey
- 8) Dr. Edem Tette
- 9) Dr. Florence Naab
- 10) Dr. Patience Anyitei
- 11) Mr. Alexander Martin Odoom
- 12) Mr. Philip Debrah
- 13) Dr. Japheth Awuletey Opintan

Ethics in Research (May, 2013)

On May 16, 2013, the Partnership conducted its final day-long faculty development workshop on the topic of "Ethics in Research." The training was done in two parts. The first part was presentations by all four facilitators. The participants were then divided into three focal groups, each addressing a case study scenario under the supervision of two facilitators. Each group wrote a brief report on their case study and presented to the other groups. Participants were from the Medical School, Dental School and the School of Allied Health Sciences. They were a total of 37 participants (16 males and 21 females).

The presentations and breakout sessions were informative and interactive. According to evaluation forms, the majority of participants scored the facilitation between very good and excellent. Many participants indicated that the knowledge gained has enabled them have better insight into topical issues in research ethics. As a result, they were going to put research ethics in a more practical perspective.

Long-Term Faculty Training

In addition to USAID funding, the partnering universities were able to successfully leverage additional non-USAID funding to meet objectives and goals, particularly in the area of faculty development and long-term training. While Masters and PhD training was not available in the partnership budget, the Ghana-Brown program successfully leveraged funds for long-term training through the Fogarty AIDS International Training and Research Program (AITRP) at Brown, funded by the US National Institute of Health.

Working with the Fogarty AITRP, the partnership prioritized College of Health Sciences schools and departments that would benefit significantly from faculty with strengthened credentials. Once these areas were prioritized, partnership staff at UG and Brown supported Masters and PhD candidates through their graduate application processes. Concurrently, the partnership assisted with each candidate's application for funding and support through the Fogarty AITRP program. Because of the support received, three candidates were admitted to PhD programs and will receive Fogarty support for the duration of their studies (including tuition and expenses), past the end-date of the USAID Partnership. Three applicants were awarded Fogarty support in March 2012 and enrolled in September 2012.

Individuals include:

- 1) Gladys Dzanzi - PhD in Nursing at Western Cape University in South Africa
- 2) Charles Awortwe - PhD HIV related Pharmacology, Stellenbosch University, South Africa
- 3) Sackey Dzidzor - Nutrition PhD at Tufts University (conditional on Tufts acceptance).

Partnership leaders will continue to provide mentorship to these Fogarty trainees as they pursue their doctorates over the next three to four years. Having three UG faculty pursuing advanced degrees and training is key to enhancing and developing academic leadership at UG.

Short-term training in the U.S.

The Partnership was able to leverage funds outside of USAID/HED in order to provide short-term training opportunities to UG faculty in the U.S. First, training was provided through the National Institutes of Health (NIH) Fogarty AIDS International Training and Research Program (AITRP). The Fogarty AITRP funded six UG faculty members to take a 6-week summer course in Clinical and Translational Research over three summers. Second, the Brown International Advanced Research Institutes, funded by the Bank of Santander, was leveraged to train an additional 12 UG faculty in a 2-week course over three summers.

Brown International Advanced Research Institutes (BIARI)

Each June, Brown University conducts the 2-week long Brown International Advanced Research Institutes (BIARI). The Institute is focused on hands-on faculty development through the development of research projects. Key promising junior faculty from around the globe are chosen through a competitive process. The BIARI is co-directed by one of the partnership's key faculty members, Dr. Susan Cu-Uvin, Director of Global Health at Brown University.

Internationally recognized leaders in HIV/AIDS gave lectures during this two week program. Funding for the BIARI comes from an unrestricted grant from the Bank of Santandar. Thus, the Partnership leveraged these funds to enhance faculty development opportunities for Ghana researchers.

Over three years, twelve faculty members from the University of Ghana and the Kwame Nkrumah University of Science and Technology (KNUST) attended Brown International Advanced Research Institutes (BIARI). The faculty members from Ghana were chosen through a competitive process, and were fully supported through BIARI to attend the institute.

Participants included:

1. Dr. Jacob Barnor, Noguchi Memorial Institute for Medical Research, University of Ghana, Accra
2. Dr. Richmond Aryeetey, University of Ghana School of Public Health, University of Ghana, Accra
3. Dr. Anthony Enimil, Komfo Anokye Teaching Hospital, Kumasi
4. Dr. Betty Norman, Komfo Anokye Teaching Hospital, Kumasi
5. Isabella Amoyaw, Korle Bu Teaching Hospital
6. Joseph Oliver-CommeyLekma Hospital
7. Joycelyn Assimeng, Korle Bu Teaching Hospital
8. Edward Adiiboka
9. Dr. Yasmine Hardy, Komfo Anokye Teaching Hospital, Kumasi
10. Dr. Amoah Mensah, Korle-Bu Teaching Hospital, Accra
11. Mr. Nana Ensaw, MPH St. Dominic Hospital, Akwatia
12. Ms. Martha Abdulai, MPH , Kintampo Research Center

Clinical and Translational Research Course at Brown University

Another short-term training opportunity that the Partnership was able to leverage was NIH Fogarty AIDS International Training and Research Program (AITRP) funding for the Brown University Clinical and Translational Research course. This training fulfilled the faculty development goal of the partnership but was funded through the NIH Fogarty AITRP.

The in-depth six-week Summer Institute at Brown University in May to June each year covered the fundamentals of clinical research. Taken for-credit at Brown University, the goal of the course was to provide the skills necessary for clinical research and measurement and evaluation. The summer program consists of two full credit courses, Research Methods in Clinical, Translational, and Health Services Research and Scientific Writing, Research Presentation, and Proposal Development.

Over three summers in 2011, 2012, and 2013, six UG faculty attended the program on NIH Fogarty AITRP support.

1. Dr. Adwoa Agyei
2. Dr. Timothy Arhpampong
3. Patrick Adjei
4. Peter Puplampu
5. William Kudzi
6. Japheth Opintan

The course provided these researchers with the skills to compete for future grants offered through UG or Brown, or other competitive grants.

Joint research

The partnership prioritized and recommended collaborative research as part of its faculty development objective. Developing expertise in clinical research at UG is a key priority of this partnership. This requires mentorship and collaboration between UG and US faculty. There were three ways that the partnership accomplished this goal: through USAID-funded development research grants, through leveraging the Center for AIDS Research (CFAR) grants, and through leveraging other Brown student grants including the Framework in Global Health grant.

USAID/HED Faculty Development Grants

To fulfill this joint research purpose, the Partnership awarded six \$5,000 to \$10,000 grants that encouraged collaboration between researchers at UG and at the U.S. partner institutions. The faculty researchers chosen for developmental grants were promising leaders in their respective disciplines at UG. The process of applying, receiving approvals, analyzing data, and submitting abstracts and publications builds faculty leadership and institutional capacity at UG.

To award these faculty development grants to UG researchers collaborating with U.S. faculty members, a US-UG working group for new research projects was created and convened. Dr. Susan Cu-Uvin from Brown and Dr. Andrew Adjei from UG chaired this working group. The working group developed an application for partnership research grants and disseminated this application to potential candidates at UG. For review, seven research were prioritized, including: HIV and TB within prisons, HIV and TB coinfections and treatment approaches, HIV in Women, engagement in HIV care and long-term follow-up, HIV infection and cervical care, HIV in marginalized populations, and HIV in children.

The Ghana-Brown partnership awarded six developmental grants, all which encouraged collaboration between University of Ghana and US institution partner faculty (Brown, Tufts, and Yale). These research projects, which represent a range of different academic disciplines, are all relevant to the HIV/AIDS epidemic in Ghana and will strengthen national capacity to address challenged related to HIV/AIDS. These projects provide an important faculty development opportunity to UG faculty, and are also beneficial to US faculty collaborators and mentors.

In two rounds of applications, a total of six developmental research grants were awarded:

1. Dr. Jim Brandful (Senior Developmental grant). Human Immunodeficiency Virus and Sexually Transmitted Infections Prevalence and Risk Factors among Migrant Workers in Ghana. Funding Amount: \$10,000. Collaborator: Dr. Mark Lurie (Brown).
2. Jonathan Quartey (Junior Developmental Grant). Developing Rehabilitation Strategy For Home-Based Care Among Pulmonary Tuberculosis Patients Living With Hiv/AIDS In The Accra Metropolis Of Ghana. Award Amount: \$5,000. Collaborators: Tim Flanigan (Brown) and Margaret Lartey (Univ. of Ghana).
3. Dr. Timothy Archampong (Junior Developmental Grant). Hepatitis B viral resistance to Lamivudine (3TC) therapy in Hepatitis B (HBV)/HIV co-infected Ghanaian Patients. Award Amount: \$5,000. Collaborators: Dr. Awewura Kwara (Brown), Dr. Tim Flanigan (Brown), and Dr. Margaret Lartey (Univ. of Ghana)

4. Dr. Richard Asmah (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Susan Cuvin (Brown Collaborator). Molecular Study of Human Papillomavirus among HIV Positive Ghanaian Women. Senior Faculty Research Grant. Funding Amount: \$10,000.
5. Dr. Alfred Yawson (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Curt Beckwith (Brown Collaborator). Sex Differences in HIV Testing and Counseling in Ghana: Factors influencing low HIV testing among men in two fishing communities in Accra. Junior Faculty Research Grant. Funding Amount: \$5,000.
6. Dr. George Obeng-Adjei (Univ. of Ghana PI), Dr. Tim Flanigan (Brown PI), and Dr. Awewura Kwara (Brown Collaborator). Putative protective effects of sulfamethoxazole-trimethoprim on malaria incidence in HIV-infected children. Senior Faculty Research Grant. Funding Amount: \$10,000.

These projects were submitted to the Internal Review Board at Brown and/or the Miriam Hospital and the UG. IRB approval at both UG and the awarding US institution was required before funds were released. IRB approval can be a long process, and partnership staff assisted the UG and US PIs to submit their proposals and answer any additional questions. All projects received IRB approval at both U.S. and Ghanaian institutions. Research activities began, and will continue past the end-date of the USAID grant, with oversight by the Brown faculty members working as mentors and collaborators.

Center for AIDS Research (CFAR) grants

The partnership promoted Center for AIDS Research (CFAR) grants at Brown University for UG applicants, and assisted with applications and finding US collaborators necessary for a successful application. The CFAR grants are awarded through a highly competitive process, and the partnership was excited to have four applicants from UG that were funded at \$30,000 each. The projects were been awarded and assisted through the IRB approval process.

The researchers and research projects are listed below:

1. Cephas Omenyo. "State-Civil Society partnerships for HIV/AIDS Treatment and Prevention in Ghana: Exploring Factors Associated with Success. Funding Amount: \$30,000. Collaborator: Michelle Lally (Brown University).
2. Richmond Aryeetey. "Sustainable food security and nutrition in HIV management in Ghana." Funding Amount: \$30,000. Collaborator: Christine Wanke (Tufts University).
3. Timothy Achampong. Hepatitis B viral resistance to Lamivudine (3TC) therapy in Hepatitis B (HBV) and HIV co-infected Ghanaian Patients. Funding Amount: \$30,000. Collaborator: Awewura Kwara (Brown). (Also funded with HED development grant, and only counted once in indicator).
4. Betty Norman. "Psychosocial influences on clinical outcomes in HIV infected adolescents in Kumasi, Ghana: A Pilot Study. " Funding Amount: \$30,000. Collaborator: Nicole Nugent (Brown)

Other Joint Research Projects

Students and faculty at Brown also participated in other research collaborations that fall under the joint research objective of the Partnership. In total, eight Brown students traveled to Ghana with support of the Partnership.

- Natasha Kumar, a Brown undergraduate, traveled to Ghana in July to August. Dr. Flanigan worked with Natasha to set up a project with Dr. Betty Norman, the head of the HIV clinic at the Komfo Anokye Teaching Hospital. Miss Kumar was assisted through the IRB review process at Brown by Dr. Flanigan, and worked with Dr. Norman to receive IRB approval at Kwame Nkrumah University of Science and Technology in Ghana. Dr. Norman and Miss Kumar's project consisted of a chart review of all new patients entering the HIV clinic for the first time in 2011. Over 4 weeks, Miss Kumar reviewed 1,000 charts.
- In partnership with Dr. Caron Zlotnik from Brown University, Prof. Margaret Lartey, head, Infectious Diseases unit and Dr. Angela Ofori-Atta (the Chief of Mental Health and Psychology at Korle Bu Teaching Hospital and the Colleges of Health Sciences), engaged in a project to understand barriers to long-term engagement to care among women. A particular focus to this project is post-partum women. After pregnancy, women are often burdened with the demands of motherhood and find it difficult to maintain their long-term follow up. This is a significant issue since HIV care requires continued adherence to appointments and medication. The three faculty in partnership with Cynthia Eleanya (who received a Zucconi fellowship from Brown University under the mentorship of Dr. Caron Zlotnik) is investigating these issues. This research is supported by non-USAID funding.
- Two Brown Medical Students traveled to Ghana in April of 2012 to participate in a TB research elective at the College of Health Sciences, University of Ghana. They worked with Dr. Forson (UG) under the mentorship of Awe Kwara (Brown). The students' names were Nicholas Nassikas and Hsiao, Vivian.
- A Brown Public Health student traveled to Ghana in the summer of 2013 to work on a collaborative research projects related to the Partnership. Paola Soto, MPH Candidate, worked under the Brown advisors (Dr. Awe Kwara and Dr. Stephen McGarvey) and an advisor from Komfo Anokye teaching Hospital,(Dr. Anthony Enimil) from May 2013 to July 2013 at Komfo Anokye Teaching Hospital on the research topic: "Tuberculosis Treatment Outcomes and Risk Factors for Mortality Among Children Living with HIV in Ghana.
- A Brown Medical Student, Christine Krueger, received a Framework in Global Health grant to be a research assistant for the research grant awarded to Dr. Asmah (UG) and Dr. Cu-Uvin (Brown) under the HED/USAID grant. Miss Krueger assisted on the project "Molecular Study of Human Papillomavirus Among HIV Positive Ghanaian Women" for 8 weeks from June 10 to August 9, 2013.
- Two additional Brown Medical students (Madeline Schrier and Paul Herman) traveled to Apam Catholic Hospital to assist and conduct research on June 4 to July 6, 2013 (4 weeks total). They worked under the mentorship of Dr. Timothy Flanigan (Brown).

Within the third objective, the partnership has been engaged in activities that enhance health care professionals' competencies through Continuing Medical Education (CME).

As part of its program, the University of Ghana Brown University AIDS Academic Partnership offered in-service education to health workers, either on its own or in partnership

with recognized organizations or programs of the Ghana Health Service. Over two years, the partnership sponsored or co-sponsored seven CME events, training over 1,000 health care professionals.

Continuing Medical Education workshops

Infectious Disease Update (June-July, 2011)

From June 27 to July 1, 2011, an update on Infectious Diseases Training Course with a focus on HIV and AIDS was provided to junior members of the Ghana College of Physicians and Surgeons. Three faculty members from Brown joined with three faculty members from the University of Ghana to present lectures and discussions on new developments on the diagnosis and treatment of HIV, TB, hepatitis, MRSA, influenza, and other infections. Thirty-six health care professionals from the Ministry of Health and the private sector were trained in HIV/AIDS management. There is great interest in the area of HIV and TB and hepatitis. This program provided in-depth lectures and discussions as well as faculty development by modeling state of the art lectures and discussion in partnership between Brown faculty and UG faculty. This update was supported by the Miriam Hospital Infectious Disease division.

HIV Treatment, Care, and Support (January 2012)

The partnership planned and coordinated an in-service continuing medical education (CME) training for health care professionals on January 25 to 26, 2012 in Sunyani, Ghana. In collaboration with the NACP, the partnership organized a two-day training with educational sessions for health workers in HIV Treatment, Care and Support for medical officers, physician assistants, nurses, midwives, counselors, pharmacists, pharmacy technicians, biomedical scientists, and data entry staff. The health workers were stratified according to professional groupings and each group had two facilitators who updated them on new developments in their area of work. There was also a session on operational challenges for which the health workers proposed solutions.

Participants were from the 10 regions of Ghana. A total of 178 participants took part in the CME (110 males and 68 females). Facilitators were drawn from the project, the National AIDS Control Program (NACP), Kwame Nkrumah University of Science and Technology (KNUST), and Ghana Health Service.

This CME represented an innovative way of delivering continuous professional development to health workers delivering HIV related services in Ghana. Two afternoons of the three day annual review meeting organized by the National AIDS Control Program (NACP) were dedicated to CPD. This innovative event also maximized the use of scarce resources, as both the NACP annual review and the CPD (which hitherto would have been held on separate occasions) were successfully run together.

Northern Sector CME: HIV Prevention, Treatment, Care, and Support Meeting (January, 2013)

In collaboration with the National AIDS Control Program, in January 2013, the Ghana-Brown partnership organized a CME event in Kumasi, Ghana. As part of its program, the National AIDS Control Program does monitoring and evaluation of the national response to the HIV epidemic in the health sector. One of its monitoring and evaluation activities is an annual review meeting for service providers. At this annual meeting, activities related to counseling, testing, prevention of mother-to-child transmission (PMTCT), ante-retroviral treatment (ART),

and health management information systems are reviewed by stakeholders. Successes and challenges are also identified and shared, and appropriate interventions are put in place to improve the national response to HIV. The UG-Brown Partnership recognized the NACP annual review meeting as a platform and opportunity to update service providers on various aspects of HIV/AIDS. This is in line with Objective 3 of the partnership, to provide continuous medical education for health workers in HIV.

The UG-Brown Partnership, in collaboration with the NACP, organized two days of educational sessions for health workers in HIV Treatment, Care, and Support. The training targeted doctors, physician assistants, nurses, midwives, counselors, pharmacists, pharmacy technicians, biomedical scientists, and data entry staff. Participants were from the ten regions of Ghana. A total of 153 participants took part in the CME. Facilitators were drawn from UG, NACP, the Technical Working Group of NACP, and Ghana Health Service. The update was tailored to the needs of each group with an overall goal to update health workers on new and topical issues relevant to the delivery of improved treatment care and support services to persons living with HIV. The CME addressed these objectives using didactic lectures, questions, case-based discussions, and sharing of experiences.

TB Update (May, 2013 in Tamale, Ghana)

The Partnership organized its final Continuing Medical Education event on the topic of “New Frontiers in TB Management” in collaboration with the National Tuberculosis Control Program. The full-day training was held on May 31, 2012 at the Tamale Teaching Hospital in Tamale, Ghana. The aim was to update health workers on current management of Tuberculosis. A total of 63 participants took part in the CME. This consisted of Doctors, Pharmacists, Nurses, Midwives, Counselors, and Biomedical Scientists. Facilitators were drawn from the project, NTCP, Komfo Anokye Teaching Hospital, Korle-Bu Teaching Hospital and Ghana Health Service. This partnership between the USAID/HED Ghana-Brown Partnership at the NTCP brings in expertise from both sides and also pools funds from both organizations to help reduce cost. It also prevents duplication of functions.

Through this training, health workers attained the level of knowledge and skills required to make an impact on various aspects of the response to tuberculosis and attempts at eliminating pediatric tuberculosis. Educational sessions included updates in TB Treatment, Care and Support for medical officers, physician assistants, nurses, midwives, counselors, pharmacists, pharmacy technicians, biomedical scientists and data entry staff. The update was tailored to their needs with an overall goal to update health workers on new and topical issues relevant to the delivery of improved treatment care and support services to persons diagnosed with Tuberculosis. The CME adequately addressed these objectives using didactic lectures, case based discussions, sharing of experiences and with ample time at the end of each session for questions which was highly interactive.

Medical Knowledge Fiestas

▪ *Medical Knowledge Fiesta 2011*

A national CME conference for practicing physicians in Ghana, the Medical Knowledge Fiesta 2011, took place in Accra from August 1st to 5th, 2011. The theme was “Cutting Edge Updates for Medical Practice in Ghana.” The event was organized by the Ghana College of Physicians and Surgeons. It was attended by over 300 physicians with 38 facilitating faculty. The University of Ghana-Brown Academic Partnership to Address HIV/ADS provided faculty for

HIV lectures and a half-day workshop. HIV lectures covered the following topics: 1) “Pediatric HIV in Resource-limited Setting: Successes and Challenges” by Dr. Elijah Paintsil (Yale); and 2) “Current HIV treatment and monitoring guidelines in Ghana” by Dr. Lorna Renner (Ghana). The Workshop on New Trends in HIV Drug Resistance and Therapy was facilitated by Drs. Paintsil and Renner. The HIV sessions were well received and the general expectation is that future CMEs will have sessions dedicated to cover HIV topics. This activity is considered in-kind and value-added, and was supported by leveraged funds.

▪ *Medical Knowledge Fiesta 2012*

A CME training geared at health care professionals was planned by the partnership for August 8, 2012 in Accra, Ghana in collaboration with the National 'Medical Knowledge Fiesta 2012,' planned and chaired by Dr. Elijah Painsil (Yale). The partnership planned a half-day HIV Update and reached 260 practitioners (157 male, 103 female). The HIV Update was scheduled as the 4th and 5th plenary at the Knowledge Fiesta, hosted at the College of Physicians and Surgeons in Accra. The Knowledge Fiesta was co-sponsored by: Ghana College of Physicians and Surgeons; Ghana Physicians and Surgeons Foundation of North America; Africa Partners Medical; and Korle-Bu Neuroscience Foundation. Three US partnership faculty including Dr. Kwara (Brown), Dr. Painsil (Yale), and Dr. Monague (Brown) presented on various topics related to HIV, TB, stigma, and elimination of mother-to-child transmission of HIV. The ultimate goal of the event was to provide continuing medication education and to develop UG's capacity to put on high-quality educational seminars.

University of Ghana Scientific Conference (September, 2012)

The University of Ghana-Brown partnership sponsored a scientific session as part of the 6th Annual Scientific Conference hosted by the College of Health Sciences at the University of Ghana. The Scientific Conference was held on September 26th to 28th, 2012 under the theme 'Lifestyle Changes and Non-Communicable Diseases.' The Ghana- Brown session was hosted on September 27th. This session has two presentations: 1) Pediatric HIV: The Trend in Ghana by Dr. Lorna Renner (Korle-Bu Teaching Hospital); 2) Legal, Ethical, and Human Rights Challenges Pertaining to Pediatric HIV by Dr. Bernard Dornoo (National AIDS/STI Control Program). These sessions were attended by faculty of the college of health sciences and health care professionals. In addition, the Partnership also presented four posters on pilot research done by students who participated in the community attachment program. A poster about curriculum development work done by the partnership was also presented, and was awarded the Best Poster of the conference. Over 100 participants attended the session.

Within the fourth objective, the partnership has been engaged in many activities that have built the institutional capacity of UG to coordinate education and research.

Institutional Capacity Building and a “Center for Excellence in HIV/AIDS”

The Partnership’s activities helped to strengthen the human and institutional capacity of the African higher education institution on several levels. Within the two-year partnership, the UG-Brown University Academic Partnership has accomplished a number of goals to strengthen the institutional capacity of higher education institutions in the area of HIV and AIDS related to human and institutional capacity. Within each of the primary partnership objectives, activities have strengthened institutional capacity in significant ways. In this way, the Partnership office at UG served as a Center for Excellence in HIV/AIDS.

A curriculum planning process was conducted in the four UG CHS schools to identify the need for augmented equipment and materials related to HIV/AIDS treatment and prevention. These curriculum development activities were significant, because the investigators and faculty involved in the project learned about the curriculum development process, which can then be applied to other schools within the UG system. Furthermore, an IT master plan in collaboration with Tufts University will utilize the ULTRA course management systems to augment IT at UG. Additionally, community attachments related to HIV and AIDS were developed which addressed working with marginalized communities and combating stigma.

Objective Two of the UG-Brown Partnership focused on strengthening faculty capacity in the area of HIV and AIDS in collaboration with the US institutions of Brown, Tufts, and Yale. Many short-term and long-term training events in the U.S and Ghana utilized expertise from both institutions focused on clinical research skills for junior faculty. This has resulted in the development of a number of research projects.

The Partnership built institutional capacity addressing HIV and AIDS at UG, as iterated in Objective 4. This includes establishing an office for this initiative, hiring a full-time Program Coordinator and Administrative Assistant, and developing MOUs and establishing bilateral exchange of students and faculty for short-term trainings. For example, hiring a Program Coordinator is an important way for UG to strengthen institutional capacity, because Ms. Quist-Therson is the first Coordinator to be hired by the project at UG CHS. Her experience on this project will be imparted to other staff and future project coordinators. Training for staff is also an important institutional capacity building activity, and it is significant that three project staff were trained in administration and financing by USAID. This will extend to other project funds and improve on the college's ability to apply for other project funds. Additionally, many separate funding sources have been identified, which resulted in successful collaborative grant submissions. Finally, financial resources from the NIH were leveraged to provide additional short term training.

PMTCT Symposium (August, 2012)

The University of Ghana-Brown University Academic Partnership, under the sponsorship of USAID and Higher Education for Development (HED), hosted a successful day and a half 'Summit' to discuss successes and challenges in eliminating Pediatric HIV in 2015 in Ghana. The event was co-sponsored by the Ghana National AIDS/STD Control Program (NACP), the Ghana AIDS Commission (GAC), Ghana Health Service, and the Ministry of Health. Held on April 25th and 26th, 2012 at the College of Physicians and Surgeons in Accra, Ghana, the Summit brought together stakeholders such as academicians, researchers, practitioners, activists, non-governmental and community based organizations, policy makers, developmental partners, persons living with HIV, and politicians to discuss the way forward in achieving elimination of MTCT. A total of 100 people attended the Summit throughout 2 days.

The Vice President of the Republic of Ghana, H.E. Mr. John Dramani Mahama gave the Summit's keynote address. During his speech, the Vice President noted that the Government of Ghana pledges an additional GHC150 million to support HIV programs in Ghana. This was received with applause as a significant milestone in the fight against HIV and a solid demonstration of country ownership. The participants at the Summit affirmed their belief and support of the goal by adopting the following Summit slogan: 'Elimination of MTCT of HIV in Ghana by 2015 - Yes we can!'

Presentations on the current MTCT in Ghana were made by Dr. Angela El-Adas (Director-General, GAC) and Dr. Nii Akwei Adoo (Program Manager, NACP). Other guest speakers included Dr. Lynne Mofenson (Chief of Pediatric, Adolescent, and Maternal AIDS Branch, NIH) and Ms. Sostena Romano (Director of eMTCT, Clinton Foundation).

The four key lessons from the Elimination of Mother-to-Child Transmission of HIV Summit are: (1) the health of the woman should be paramount and is the key for elimination of MTCT; (2) the need for country ownership of HIV eradication efforts and programs; (3) leveraging synergies, linkages and integration of care; and (4) HIV elimination should be a shared responsibility: the

Success Stories

Community Attachments Success Story

Ghanaian Health Sciences Interns Explore HIV Patient Care beyond the Textbooks
Accra's hospitals boast quality care for its growing population, but just outside of the capital, Ghana's ample coastline is dotted with under-staffed hospitals and clinics in small fishing villages. The residents of these rural communities depend on basics, often-limited resources and the regular public awareness education sessions that their hospitals offer on a weekly basis. With an increased need for health workers knowledgeable about the specific care and treatment for people living with HIV/AIDS, several hospitals welcomed the opportunity to share the reality of rural health care with University of Ghana allied health sciences, nursing and medical students through a training program.

Such a program is one element of a multi-faceted USAID-funded, HED-managed partnership between Brown University and the University of Ghana. With the involvement of a network of hospitals, the six-week program allows talented health sciences and medical students to learn practical approaches in responding to the needs of people living with HIV/AIDS and other diseases such as malaria, tuberculosis, hypertension, and malnutrition, which can further compromise the health of HIV/AIDS patients.

Two University of Ghana students, Mabel Torlu and Sylvia Takyl, were selected as interns at Apam Catholic Hospital and soon became accustomed to the hospital's routines and nurturing staff. "When they first come, they have fears; they are shy," says Rev. Father Augustine Essel, head counsellor at Apam Catholic Hospital, about the interns. "After, they see how we are and they are relaxed." Essel also notes that students, who might grimace, hold their chests and turn away when a person with HIV or AIDS coughs, later learn and respond differently as their level of comfort and confidence builds. The expansion of the students' skills is a direct result of new experiences at a rural hospital that are beneficial to both the hospital staff and the interns. "Some will learn from books, but some will learn about the people," said Essel, highlighting the importance of field work.

Torku, a nurse, first encountered how to care for HIV patients at Apam Catholic Hospital because of the partnership program between the University of Ghana and Brown University. "I have never come to learn about an HIV person until now," said Torku. "I had the opportunity to put smiles on people's faces. When you come to rural areas you realize how much they need you."

Takyl also served at the hospital in Apam twice a week in early 2012 and visited all the wards to survey and address the needs of patients in the HIV unit who had dietary-related issues. She also worked in the accident center, female, male, children's, and maternity wards.

Takyl transferred the lessons learned at the hospital to her studies and what she learned in class, she applied to her work at the hospital. "[The program] exposed me to a lot of new diseases which I had not seen in the city," said Takyl. "It made me read a lot and made me conscious of other things that I had not seen before. Things that were not taught in class, I had to learn them before getting into class. When I got into class, I was even having an upper hand because I knew before my mates knew."

At the hospital, when she observed that many patients consumed food brought from outside the hospital that was neither nutritious nor hygienic, she alerted hospital staff and created

a hospital menu to initiate a kitchen. Her effort to control access to unhealthy food and offer patients more hygienic options was one solution the hospital quickly implemented to attempt to minimize sickness aggravated by poor diet. By the end of her internship, Takyl was invited home—to serve as the staff dietician in her home village of Apam.

Apam Catholic Hospital in was established in 1959 and has 105 beds. Since 2008, Apam Catholic Hospital has been reporting the number of people who test positive for HIV; numbers peaked at 167 in 2009. The people who go to get tested still face some level of stigma and the caring hospital staff take measures to ensure that each individual's status is confidential.

“This is a good program for students to come from the city and go to the village to help our people,” said Sister Mary.

Long-Term Training Success Story

University of Ghana's College of Health Sciences maintains a roster of talented lecturers across its seven schools, including the Schools of Nursing, Medicine, Dentistry, Allied Health Sciences, Public Health, Pharmacy, and the Noguchi Institute for Medical Research. Faculty members are tasked with preparing students for the realities of the workforce with modern tools; therefore, the University of Ghana's administrators sought out opportunities to bolster the quality of education it provides to today's HIV/AIDS educators and health care workers. Gladys Dzansi, an assistant lecturer at the School of Nursing, College of Health Sciences knew the path to advancement in her studies and career would require obtaining her doctorate, but finding a school with the program she wanted and affordable rates was proving to be a predicament. “We don't have a PhD nursing program in Ghana and the university requires that as a faculty member, you should have a PhD to keep your appointment with the university. It became necessary for me to look for schools.”

With time running out for her to secure enrollment in a nursing PhD program and maintain her teaching position at UG, Dzansi, a clinical supervisor for six years and lecturer for three years, applied for a Brown Fogarty AIDS International Training and Research Program (AITRP) scholarship funded by an NIH training grant (D43TW000237), in collaboration with the Brown University-University of Ghana Academic Partnership to Address HIV/AIDS. Brown University and the University of Ghana hold a partnership funded by the U.S. Agency for International Development and managed by Higher Education for Development for the development of programs that offer health workers modern and sustainable treatment education that will enable them to support people living with HIV/AIDS in varying socio-economic conditions. This two-year partnership is part of the Africa-U.S. Higher Education Initiative and offers educational support in HIV/AIDS for health sciences students and current health workers in Ghana through internships, online training, and faculty development.

Dzansi was one of three lecturers supported by the Ghana-Brown partnership and Fogarty AITRP to enroll in long-term training. She will attend a “sandwich” program at the Western Cape University in South Africa, where she will spend three months a year. During the other months of the year, Dzansi will take online courses through Western Cape University while continuing her faculty duties at the University of Ghana. Although the opportunity to earn her PhD will require being away from her son during her studies in South Africa, Dzansi is confident that her research in the use of mobile phones to improve treatment adherence can improve the lives of people living with HIV and support Ghana's health care system. “I recognized that despite the availability of drugs, people still have problems with quality of life,” said Dzansi.

With a simple call, health workers can follow-up on patient care with appointment reminders, discuss medication adherence, and gauge the patient's emotional wellbeing.

The other two UG candidates supported by Fogarty AITRP will seek degrees in HIV-related Pharmacology at Stellenbosch University in South Africa and in Nutrition at Tufts University in the United States.

In addition to reaching people living with HIV/AIDS, the ultimate beneficiaries, with high-quality, modern care, Dzansi's opportunity will provide a sustainable resource to the University of Ghana through a South-South collaboration. She is already a member of the partnership committee working on revising UG's School of Nursing curriculum, and is willing to do more upon completion of her degree. However, her expertise and influence includes more than course development. Dzansi mentors her fellow faculty members as well as students who are in pre-service training that includes HIV health care. Through her interactions with nursing students, she brings forth sound instruction with an enthusiasm that motivates her students. "She is such a devoted lecturer. No matter what time of day, she is there for you," said Mabel Torku, a University of Ghana nursing student. "She is so interested in helping people; she is an asset." Dzansi is thankful for the opportunity to progress in her career, mentoring from the Brown, Tufts, and UG partnership faculty, and encouragement from the administration and the College of Health Sciences provost. "The partnership has brought benefits to us and given us opportunities," she said.

Development Outcomes

Impact on Millennium Development Goals

Partnership activities strengthened the capacity to address Ghana's development goals, as outlined in the country's Millennium Development Goals (MDGs).

Partnership activities relate to MDG Goals 4 and 5, reducing child mortality and promoting maternal health, because the partnership prioritized pediatric HIV and HIV in women. Training of healthcare workers to effectively manage HIV in children and women will likely have an impact on reducing child mortality in Ghana in the long-term.

MDG Goal 6, combatting HIV and other diseases, is in line with all partnership activities because of the project's educational, faculty development, CME, and institutional capacity activities all directly related to HIV in Ghana. A development goal is to reduce HIV by 50%, reduce Mother to Child Transmission to <2%, and increase ART coverage from 36% to 80%. Reviewing pre-service curriculum with an aim to improve on these resulted in teaching in HIV/AIDS that empowered health workers to contribute to achieving these goals in their various capacities. Additionally, because combatting TB is a major part of this development goal, TB research was prioritized, and partnership activities were beneficial in reducing mortality and morbidity.

Finally, MDG Goal 8, developing a global partnership for development, is significant for this project, which aimed to create a sustainable partnership between UG and Brown, as well as other US and Ghanaian institutions.

Strengthening Host-country Stakeholders

The UG-Brown University Academic Partnership to Address HIV/AIDS has strengthened a number of host country stakeholders.

The collaboration worked closely with Ghana AIDS Commission and the National AIDS Control Program (NACP) to review and improve existing curricula, training, and measurement and evaluation. Partnership meetings prioritized this need. Resources are being made available through US institutions to augment expertise at the University of Ghana.

Partnerships were developed with community-based organizations both in the Eastern Region (which has a high prevalence of HIV) as well as in Accra to develop community attachments for students. These attachments helped to combat stigma and discrimination among marginalized communities.

Partnerships were developed with other educational institutions outside of UG. This includes Kwame Nkrumah University of Science and Technology (KNUST) and the University of Development Studies (UDS) in northern Ghana and the University of Cape Coast. The CME trainings and faculty development workshops in the second year of the partnership engaged these universities. In addition, faculty from these universities were invited to participate in the BIARI (Brown International Advanced Research Institutes) as well as in the Fogarty AITRP (AIDS International Training and Research Program). The partnership also started to improve capacity at the Kwame Nkrumah University of Science and Technology by sharing with them calls for proposal for CFAR.

Challenges

Procurement and Installation of TUSK/ULTRA

A significant challenge was procuring and installing TUSK equipment and servers. There were significant bureaucratic bottlenecks in implementing national procurement regulations for the purchase of TUSK servers. There were additional delays in delivery because the hardware could not be procured in-country. These bottlenecks in the procurement process and supplier issues hampered activities to install TUSK and train staff and faculty on the partnership's activity timeline. Even after TUSK servers were procured at UG, the servers were not configured correctly by the company, and the Raid array of hard drives were not compatible with the machines. It took nearly two months for the proper parts to arrive and be installed. Another challenge was that the Tufts systems administrator working on the project left Tufts during this period. Another systems administrator was found, but activities stalled during the transition to the new staff member. As Tufts and UG were preparing to start working to install TUSK, the new Tufts system administrator realized that the version of Ubuntu Linux installed used the wrong version of Perl, the programming Language of TUSK. This meant the re-installation of the operating system.

Dedication and constant follow-up by UG and Tufts IT and program staff ultimately drove successful procurement and installation of TUSK at UG. The TUSK servers were received by UG in March 2012, and UG IT staff worked closely with Tufts IT staff to set-up the programs. Dedication and constant follow-up by UG IT and program staff was needed to address this challenge. UG IT staff were in constant contact with Tufts IT staff to set-up the programs. An on-site follow-up visit from Tufts IT staff also assisted with the installation.

Delay of Release of Year 1 and Year 2 Funding and Uncertainty over Future Funding

The main obstacle faced in the early stages of the Partnership was the delay of funding from USAID/HED. Funding was expected in April 2011, but was not received until July 2011. This delay in funding significantly delayed partnership activities, especially related to curriculum development and long-term faculty training and development. However, the funding delay encouraged Brown and UG to identify and engage other funding sources to leverage other resources, such as the Brown International AIDS Training and Research Institutes (BIARI) and the Fogarty AIDS International Research and Training Program (AITRP). Therefore, the Brown-UG Academic Partnership transformed this obstacle into a major success story.

The partnership also ran into implementation challenges as it transitioned from Year 1 (ending June 30, 2012) to Year 2 of the grant. Year 2 activities officially began on July 1, but Brown did not receive the modification of the agreement from HED to release Year 2 funding until mid-September, about two and a half months after the start of Year 2. This was a challenge as Brown could not issue sub-awards or release funds to our partners (Yale, Miriam, Tufts, and UG) until this modification was executed. The HED-Brown contract was not executed until mid-October, and Brown issued sub-awards to its partners quickly after this modification with HED was issued. However, the over three-month delay in funding was very challenging for our partners, particularly the University of Ghana. In Year 1, Brown advanced funds quarterly to UG, and UG always maintained about \$20,000 in the partnership account. Because funds were not able to be advanced from Brown until mid-October when the subcontract was issued, some activities were stalled. Initially, to cover this funding gap, the College of Health Sciences pre-financed the Partnership's operations, but it was more and more difficult to continue with the trend as the months went by. As of September 30, 2012, the UG partnership account was \$30,000 in the red. Brown partnership staff followed up with HED staff consistently to get updates on the status of release of Year 2 funds. Brown was prepared to issue sub-awards and funds as soon as the modification with HED was issued, and the university moved quickly once the modification from HED was received. UG also covered the funding gap, and the College of Health Sciences pre-financed the partnership's operations for several months.

The Partnership also struggled with the uncertainty over future funding and whether carry-forward would be granted in a no-cost extension. However, it was difficult in the final six months of the Partnership to strategize about the sustainability of certain partnership activities while being uncertain about continued funding. The partnership continued with planned activities, and discussed options moving forward for both being refunded and not being refunded for a third year. The partnership also leveraged additional funding in the past years for certain activities (including short-term training and research), and these leveraged funds will continue to be prioritized in the future.

CONCLUSION

Lessons Learned

Communication

Effective communication between all partners was required for success of the Partnership. Significant administrative work in the first quarter facilitated the creation of sub-agreements between Brown and each institution. At Brown and UG, weekly administrative meetings ensured effective coordination within each institution. Biweekly or monthly program meetings between Brown and Ghana were also scheduled to facilitate communication between all stakeholders. Larger face-to-face meetings, including Annual Partners Meetings in the U.S. and Ghana also successfully engaged all stakeholders in partnership planning and activities (including leaders from Tufts, Brown and UG and representatives from the Ministries of Health and Education, the Ghana AIDS Commission, USAID, and HED).

Importance of Leveraging Resources

The University of Ghana-Brown Academic Partnership to Address HIV/AIDS in Ghana was highly successful in leveraging resources to provide faculty development research and training opportunities to University of Ghana faculty. In addition to USAID funding, the partnering universities were able to successfully leverage additional non-USAID funding to meet objectives and goals, particularly in the area of faculty development and training. First, Brown and Tufts Universities receive funding through the National Institutes of Health (NIH) Fogarty AIDS International Training and Research Program (AITRP). This program was utilized successfully to enroll and fund three long-term PhD trainees from UG, highlighted in Objective 2 of the partnership. Fogarty AITRP also was leveraged to select and enroll Brown's Summer Institution on Clinical and Translational Research. Additionally, Brown leveraged unrestricted funds for faculty development training in the Brown International AIDS Training and Research Program (BIARI). BIARI is supported by Bank of Santadar. Finally, Center for AIDS Research (CFAR) funding was used to provide developmental research grants to UG faculty, in the amount of \$30,000 each.

Working with Technology-based systems

Working with technology-based systems (e.g. ULTRA) is difficult in international settings. There are significant differences in hardware, software, resources, and training that are available in the US and Ghana, and this stalled implementation of ULTRA. Dedication and constant follow-up by US and UG IT and program staff ultimately drove successful installation of ULTRA at UG. An on-site follow-up visit from Tufts IT staff was also helpful for successful installation, as were constant Skype and phone calls. Additionally, adhering to and ensuring correct specifications can be a challenge but is necessary for collaborative success. Procurement systems at UG and in Ghana can be slow and bureaucratic, so early planning is necessary to adhere to timelines. Even with these challenges, ULTRA is finally installed and ready for uploading content, which has been developed together with UG and US faculty.

Continued Partnership Activities

- Support 6 faculty research grants as projects are implemented and completed. Progress reports to the IRB are required.
- Support the Univ. of Ghana Teaching and Research Application (ULTRA), ensuring the course management system's sustainability and use by students and faculty at University of Ghana. Possibility of developing teaching materials and lecture notes for pre-service training, to be uploaded onto ULTRA. Also opportunity to develop, pilot, and post certificate online courses.
- Support short-term and long-term trainees enrolled in programs in the US and South Africa (in collaboration with Fogarty AIDS International Training and Research Program and Brown International Advanced Research Institutes).
- Assist to plan annual continuing medical education training, "Medical Knowledge Fiesta," in August 2013. Engage key stakeholders and partners.
- Continue identification and engagement of funding sources.

Use of internet-based learning with evaluation and certification for pre-service teaching as well as post graduate CME for HIV / AIDS throughout Ghana.

The Partnership would be interested in seeking financial support to continue to develop the ULTRA online-learning tool for pre-service teaching and CME for HIV/AIDS throughout Ghana.

The ULTRA tool will greatly facilitate ongoing teaching, development of curricular, teaching and student materials, scheduling, and education interaction. ULTRA, of course, can be utilized for teaching in a wide variety of disciplines. It is well suited to develop online teaching modules related to HIV and AIDS with interactive evaluation and a certification process. The modules have been developed which addressed HIV and AIDS treatment with antiretroviral therapy, opportunistic infections, HIV and TB co-infection, HIV and pediatrics, and prevention of maternal to child transmission (PMTCT) of HIV. In addition, modules have also been developed which address HIV stigma and the law, adherence to medication and treatment, HIV and Mental Health, and HIV and Interdisciplinary practice. It is anticipated there will be additional modules throughout to address HIV testing, the epidemiology of HIV in Ghana, the engagement of most at risk groups and key populations to reduce HIV transmission and an overview of Hepatitis B and C co-infection.

Each of these modules can be standardized so that a series of ten questions will be developed at different points in these modules to review key aspects. Each of these questions will be provided in the form of a case history. Following each case, there will be three to four possible answers. Each question will be followed by an explanation so that if a certain question is chosen and it is incorrect, the reason why it is incorrect will be explained. For individuals to pass each section, they will be required to get eight out of the ten responses correct. If more than 2 out of 10 are answered incorrectly, then the individual will need to go back and take the test again. Once an individual has taken all the modules and have passed them, they will get a certificate. The partnership will work closely with the Ghana Medical and Dental Council so that the individuals that receive certification through this process will receive CME credit equivalent to four hours or 6 points.

It is anticipated that this certification package would be available to students in the pre-service curriculum as well. The partnership is hoping to work with faculty members at University

of Development Studies (UDS), Kwame Nkrumah University of Science and Technology (KNUST) and University of Cape Coast so that these universities can adapt this system if they wish, or utilize it exactly as is and offer it to all their medical students in pre-service training. Discussions will need to take place with the leadership of each of these Universities to determine who is best suited to lead this process. A buy-in and adaptation will need to be done so that it is appropriate for the level of each student. Students may have individual questions as well that will need explanation. In addition, the teaching product will need to be changed and modified based on specific feedback. It is anticipated that this will take place most intensively during the first year. After that, there will need to be ongoing adaptation which will be the responsibility of each individual school in collaboration with the Center for HIV and AIDS at the University of Ghana.

Appendix
Partnership Photos



Dr. Susan Albright meeting with the Deans and Directors of the College of Health Sciences schools during a trip to Accra in November, 2012.



Mr. Chris Yebuah leading a ULTRA workshop at UG.



Prof. Margaret Lartey speaking at the eMTCT Summit in April, 2012.



Stakeholders at the eMTCT Summit in April, 2012.



The Keynote Address at the eMTCT Summit in April, 2012 was given by the then-Vice President of Ghana, H.E. Mr. John Dramani Mahama.



University of Ghana student Mabel Torku, head nurse Sister Mary Magdalene, University of Ghana student Sylvia Takyl, and Rev. Father Augstine Essel pictured on the grounds of the Apam Catholic Hospital. (Photo credit: Awewura Kwara, Brown University).



At the Partnership Launch in September, 2011 with representatives from UG, Brown, Yale, and HED.



Dean Edward Wing of the Warren Alpert Medical School of Brown University meeting with Provost Aaron Lawson on the College of Health Sciences at University of Ghana.