

PEER/Liberia Concept Note

Title: Building Physician Workforce Capacity: Liberia's National Health Workforce Program

Project Site: A.M. Dogliotti College of Medicine and the Liberia College of Physicians and Surgeons, Montserrado County

Background

With less than 250 physicians practicing in Liberia, the country struggles with one of the lowest physician densities in Sub-Saharan Africa. Fourteen years of upheaval saw the disruption of education, the mass exodus of skilled instructors, and irregularity in the availability of training programs for the health workforce. Currently there are less than 15 Liberian specialist physicians practicing in the public sector. As a result of this, the Government has planned an ambitious inter-ministerial Health Workforce Program (HWP) designed to achieve targeted improvements in the quality, quantity, and skill diversity of the national health workforce and improve access to safe and quality health services in Liberia by 2021.

Liberia has one medical school, the A.M. Dogliotti College of Medicine (AMD), which was founded in 1968 and is part of the University of Liberia. The administrative structure under the Medical School Dean follows the leadership of the Associate Dean, who serves as Chief Medical Officer at John F. Kennedy (JFK) Medical Center, as well as Pre-Clinical and Clinical Coordinators, who are appointed by the Dean. Currently, AMD has three full-time faculty; Dr. Z'Sherman Adams serves as the full-time Dean and two other faculty teach Cell Biology and Genetics and Biostatistics. Nine part-time faculty cover the following courses: Anatomy; Biochemistry; Embryology and Histology; Laboratory Medicine; Pharmacology; Physiology; Neurophysiology; Neuroanatomy; and Ethics.

At AMD, the intended path of study for students seeking a medical degree is five years of study followed by a two-year internship. The curriculum has two main components: pre-clinical (basic science) during the first two years, and clinical, which covers the remaining three years. In each school year, there are two semesters, but dates are irregular due to faculty constraints. The pre-clinical division includes the departments of Human Anatomy, Physiology, Pharmacology, Microbiology, and Biochemistry; the clinical division includes departments of Internal Medicine, Surgery, Pediatrics, Obstetrics and Gynecology (OB/GYN), and Radiology. A student pursuing the degree of Doctor of Medicine at AMD is required to take 36 courses. Annually, AMD enrolls approximately 40 students, but attrition is a major problem.

In 2014, an MOH assessment of AMD found that many medical students graduated from the five-year medical program in eight or more years and that approximately 50% of enrolled students elect to withdraw. The high attrition rate was determined to be the consequence of inconsistent funding for the medical school, insufficient availability of faculty, minimal access to supervised clinical training, and dilapidated educational and residential infrastructure.

Medical licensure is a requirement to operate as a medical doctor in Liberia. The Liberia Medical and Dental Council have oversight of the internship program after graduation as well as licensing medical professional in the country. For a specialist, evidence of board certification is required.

In 2013 the Government established the Liberia College of Physicians and Surgeons (LCPS) in response to the country's critical shortage of physicians. The LCPS is convener and lead organizer for the Graduate Medical Education programs in Liberia and is charged with the mission to produce medical specialists who will demonstrate the highest standards of medical expertise, starting with

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four clinical disciplines: Internal Medicine, OB/GYN, Pediatrics, and General Surgery.

The day-to-day operations, including oversight for the implementation of projects, are run by the LCPS Secretariat headed by a Secretary General. A five-member Executive Committee sets policies and ensures the training of residents runs smoothly. The ultimate decision-making body is the 19-member Post-graduate Medical Council that includes the Dean of AMD.

LCPS matriculated its first cohort of 19 residents in September 2013 and a second cohort of 18 residents in July 2015. The third cohort of 19 residents started in July 2016. The total number of residents currently in the program is 47. Projections show that the LCPS will produce 178 specialist physicians by 2025, with an expectation that half of each entering cohort will continue into the Fellowship track to sustain training programs.

There are currently nine full-time faculty working at the JFK Medical Center and Redemption Hospital in Monrovia, Phebe Hospital in Bong County, and Jackson F. Doe Regional Referral Hospital in Nimba County. Faculty focus on Internal Medicine, Endocrinology, Nephrology, Dermatology, Neurology, Psychiatry, OB/GYN, Pediatrics, and Surgery.

The West African College of Physicians (WACP) and the West African College of Surgeons (WACS) support accreditation, curriculum development and revision, and capacity building. Both of these governing bodies convene members annually and also administer fellowship and membership exams twice yearly.

Objective 1: Strengthening medical training and building subspecialty medical capacity in Liberia

Improvements of existing training programs

Liberia currently has four nascent medical residency training programs which began in 2013. Training of post-graduate students was interrupted in 2014 and early 2015 due to the Ebola epidemic which has delayed the first-ever graduates to this year. Four specialties in the following order of priority: 1) Pediatrics; 2) Internal Medicine; 3) General Surgery; and 4) OB/GYN are in need of urgent investment to strengthen existing training programs. Academic partnerships in each of the areas have been established using World Bank and U.S. Government (Health Resources and Service Administration [HRSA]) resources. The Pediatrics program has partnered with Boston Children's Hospital/Harvard, Internal Medicine with Yale University, General Surgery and OB/GYN with Mt. Sinai Medical School. These universities will be deploying visiting faculty for the next twelve months from July 2017 to June 2018 to support a full academic year. After the first year, partial funding remains to support the deployment of visiting faculty to train Liberian post-graduate students and additional resources are required to fund the existing academic partnerships in order to have sufficient numbers of faculty to meet curricula needs.

As the post-graduate training programs have yet to graduate its first-ever cohorts of trainees, the LCPS is in the process of undergoing a WACP and WACS accreditation review. A pre-accreditation assessment was conducted by the WACP and WACS, the U.S. HRSA, and the American International Health Alliance. Identified gaps at training hospitals were identified and are being addressed by Liberia's Ministry of Health (MOH) and the LCPS in order to meet accreditation standards.

AMD, Liberia's sole medical school which graduates approximately 40 students each year currently has only three full-time faculty for the entire institution. Lectures for medical students are infrequent and irregular due to faculty shortages and the institution is at risk of closing down if urgent medium-term resources are not secured. AMD has recently partnered with Addis Ababa University and Yale University in order to fill critical faculty shortage areas with visiting faculty. Yale University is also helping the medical school implement the initial year of the national pre-clinical faculty sustainability program. In addition to the urgent need for pre-clinical faculty, the medical

school has recently requested its partner, Yale University, to help AMD undertake a full medical education curriculum review since the last review took place in 2010.

As both the medical school and LCPS seek to strengthen and develop curricula, key activities to improve infectious diseases education are necessary to address both immediate education delivery needs as well as training to improve clinical care relevant to Ebola survivors. Through the PEER grant, AMD and the LCPS would like to take on the following activities:

- Develop detailed curricula and integrate components and teaching methodologies in infectious diseases for Pediatrics, Internal Medicine, General Surgery, OB/GYN, and general medical school curricula
- Train existing faculty on education delivery methods for updated curricula (e.g. pedagogy workshops for classroom-based and clinical education)
- Update and integrate medical school pre-clinical and clinical curricula to emphasize competency and skills-based training in infectious diseases and general medical education areas
- Improve clinical availability and teaching in Medical Microbiology, Chemical Pathology, Hematology, and Histopathology to meet accreditation standards
- Improve clinical availability and training in intensive care to meet accreditation standards
- Improve hematology, morbid anatomy, chemical pathology, and microbiology services and training to meet accreditation standards
- Strengthen clinical instruction and supervision including improving the system for clinical log booking of training procedures and hours
- Establish a clinical training office at JFK Medical Center to coordinate AMD and LCPS clinical training
- Career fair for physicians to learn more about specialty training program and requirements
- Post-graduate entrance exam examination preparation course to bolster postgraduate program enrollment

To accomplish the above list of activities to strengthen infectious diseases training and existing training programs to achieve accreditation standards, visiting faculty utilizing existing academic partnerships, medical equipment and teaching supplies, and administrative support are necessary at AMD, LCPS, and clinical training sites.

Graduates of this training investment will be mainly employees in the public sector where positions have been established to hire additional medical doctors. Given Liberia's critical shortage of physicians, the Government has prioritized hiring of medical school graduates at various facilities across the country using national and donor funding. Post-graduate students are already on government salary during their training years and will receive an increase in remuneration upon successful completion of their training. The MOH, through an Inter-Ministerial Task Force, has prioritized long-term financial planning with the Ministry of Finance and Development Planning, Ministry of Education, and legislatures to ensure adequate resources to hire physicians continue for years to come.

New Training Programs

A.M. Dogliotti Pre-Clinical Faculty Sustainability Program

The Government of Liberia has established a pre-clinical sustainability plan to address the critical shortages of pre-clinical faculty at AMD. This plan includes a teaching apprentice program component for establishing a pipeline of Liberian pre-clinical faculty members at the medical school. The program, initially being implemented by Yale University in partnership with AMD, involves three phases: 1) Supervised teaching experience, 2) Graduate training abroad (master's degree), and 3)

Mentorship in transition to faculty. At present, only partial funding for this program is available through World Bank resources.

Complimentary resources are needed to fund visiting faculty, study abroad tuition and fees for master's degree education (currently not available in Liberia), workshops on faculty supervision, and medium-term mentorship of recent master's degree graduates for transition to junior faculty positions. The following set of activities is needed in order to fully implement the national pre-clinical faculty sustainability program:

- Establish and implement pre-clinical faculty development workshops on teaching pedagogies and methodologies (e.g. flipped classroom, self-directed learning, small group discussion format)
- Supply faculty apprentices with stipend/honoraria for participation in co-teaching activities
- Fund regional study abroad programs for a total of 12 (with a gap of 6) trainees over four years
- Procure teaching materials and equipment for AMD

Internal Medicine Infectious Diseases Fellowship

As the LCPS's Internal Medicine post-graduate program is further strengthened over the next four to five years and multiple cohorts have graduated, there is a need to develop sub-specialty training. At present, with Liberia's current and future projected disease burden, an Infectious Diseases sub-specialty Fellowship Program will both contribute to the long-term care of Ebola survivors and fill a critical service delivery gap in Liberia. By 2021, Liberia expects to have ~20 qualified, locally trained Internal Medicine specialists. By this time, it is expected that there will be a pool of Internal Medicine specialists with some interested in sub-specializing in Infectious Diseases. Currently, Yale University, the Internal Medicine academic partner of the LCPS, is supporting recruitment and deployment of Internal Medicine visiting faculty including an Infectious Diseases subspecialist. Through PEER grant support, the LCPS would like to develop an Infectious Diseases Fellowship (sub-specialty) training curricula and program to eventually launch a sub-specialty training program. The fellowship program will need to align to WACP standards and include accreditation standards for training (inclusive of clinical training site standards). The following activities are needed in order to develop the subspecialty training program:

- Develop Infectious Diseases subspecialty training curricula
- Develop operational plan outlining implementation requirements
- Develop Liberia-specific accreditation criteria for Infectious Diseases fellowship training

Family Medicine Post-graduate Training Program

In Liberia, the majority of physicians are generalists without the necessary advanced training to deliver the complex care that is required in rural and urban settings. Directly after five years of medical school training, newly minted physicians are required to do two years of internship where normally physicians are deployed to rural facilities due to the country's attempt to distribute the few physicians it has. These junior physicians do not receive further training in complex care, prevention and management in areas such as infectious diseases or non-communicable diseases. Liberia plans to commence a Family Medicine residency training program in order to upgrade the skills of general practitioners through formal residency training.

Activities needed to launch and implement the Family Medicine residency training program include:

- Visiting faculty for Family Medicine residency training

- Travel for post-graduates for rural posting at JJ Dossen Hospital
- Rural housing furniture, equipment, and appliances
- E-library/e-journals subscriptions
- Information Technology equipment (projectors, display stands, computer adaptors, etc.)
- Academic social program in rural posting

Objective 2: Improving Liberia's ability to conduct clinical research

Complementing the training of physicians and physician specialists, there is a need to develop clinical research capacity amongst Liberian medical and academic institutions. Prior to the Ebola outbreak of 2014, Liberia's *National Health and Social Welfare Plan (2011-2021)* highlighted the need to establish a national health research agenda and to conduct research in a variety of areas, including operational research, traditional complementary medicine, cancer and infectious disease, and health promotion interventions. Also, an emphasis was placed on training academic staff to have the necessary skills to carry out action-oriented research. This need for clinical research capacity is even greater now, as the ability to manage disease surveillance, minimize the risk of viral re-emergence, and provide appropriate care for the region's nearly 17,000 survivors requires an increase in long-term scientific and clinical capacity.

Major activities that are expected to be undertaken with PEER support include:

- trainings on key aspects of clinical research;
- workshops on connecting faculty and students in Liberia with research opportunities;
- salary costs for a clinical research lead at LCPS and AMD; and
- training on key aspect of clinical research in line with Liberian endemic diseases.

Currently, minimal support in the form of small awards (< \$500) is provided to a handful of students to undertake research. The current faculty present at LCPS and AMD act as mentors for the conduct of this research, but there is minimal support that can be provided given the myriad of responsibilities as a teacher, practicing physician, and administrator. PEER funds will be utilized to develop and implement a competitive research award process that will provide stipends for trainees to encourage research proposal development and implementation. Student research projects will be presented annually at the PEER/Liberia "stakeholder" meetings in Monrovia.

With the addition of a U.S. academic institution to the process, students will be able to access the clinical research infrastructure that is available at many U.S. institutions. Through mentorship and linking to other research opportunities, medical students and residents will be supported to undertake ambitious and critical research that can impact patient care in Liberia. Furthermore, collaboration and mentorship activities will be planned in order for the LCPS and AMD to build capacity for identifying international research opportunities and applying to them. Such activities will include:

- guidance on suitable management and financial systems that should be in place at each institution;
- twinning between U.S. academic institutions and Liberian counterparts at the LCPS and AMD to build capacity for handling administrative functions of grant management; and
- assistance in identifying sources of potential funding for students and post-graduates.

When students are beginning at AMD, they are often unprepared for the rigorous basic sciences curriculum, which results in a high attrition rate among first-year students. Efforts are being made to provide a remediation program for these students as they enter the medical school. With this issue being addressed, activities will be undertaken to improve research literacy training at LCPS and AMD

by developing and implementing a scientific comprehension “crash course” and journal club with faculty and trainees. LCPS currently has a journal club, so the focus will be on strengthening it to ensure it is including research that is applicable to the unique post-Ebola landscape in West Africa.

With PREVAIL undertaking a massive research effort at JFK Medical Center, this program will be leveraged so that its researchers can teach research methodology at LCPS and AMD. PREVAIL has four goals in its work in Liberia: 1) Conduct high quality research; 2) Establish and sustain the expertise required to conduct research; 3) Build sustainable research capacity; and 4) Optimize organizational effectiveness. One of their objectives is to develop a manuscript writing seminar and coaching program. LCPS and AMD will collaborate with PREVAIL to ensure this program is incorporated into curricula at both institutions. Additionally, there are currently efforts to establish core competency within PREVAIL for grant writing and development; linking students and residents, as well as both LCPS and AMD to this support will be a critical capacity building activity.

Objective 3: Strengthen the capacity of the Liberian referral system

The national referral system between primary and secondary care facilities and JFK Medical Center is inadequate with many barriers to referral. In the aftermath of Ebola, it is vital that efforts are made to strengthen the referral system so that Ebola survivors are connected to the highest quality of care and receive immediate follow-up for any lingering symptoms. As a result of the HWP, there are a number of key investments to improve infrastructure and data systems flow throughout the health system that will impact referrals and care for Ebola survivors.

PEER funding will be leveraged to the extent possible to strengthen the Liberian referral system. Specifically, the emphasis on improvement of the quality of instruction at both LCPS and AMD will result in high quality graduates that have a particular knowledge of infectious diseases. Deploying these doctors throughout the country will consequently result in improved strengthening of referrals.

Additionally, efforts will be made to devise a communication campaign that details the referral system and makes it more intuitive for health workers. PEER funding is not adequate to fully implement such a campaign, thus resource mobilization efforts by LCPS will occur to secure funding for this activity.

U.S. Partnership Objectives and Role

Since the establishment of LCPS in 2013, officials have been utilizing personal and professional networks to recruit potential full-time individual faculty. This search has resulted in only six full-time faculty being recruited between 2013 and 2015. A 2016 search for faculty through the same means, including in-person visits to the West African sub-region and tapping into the international network of the WACP yielded just a single application.

The above experience has reinforced the need for academic partnerships, which have already supplied short- and long-term faculty to Liberia's graduate medical residency program by repurposing Ebola funds no longer being utilized for emergency response. Since 2015, Liberia has formalized its academic partnerships utilizing World Bank and U.S. Health Resources for Services Administration funding. In order to prevent fragmentation of financial resources and programmatic activities, the LCPS and AMD have selected single academic institutional partners to develop deep long-term institutional relationships with in five major program areas.

The following table displays the one:one academic partnerships providing visiting faculty and other programmatic resources across five major program areas:

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Name of Program	Academic Partner	Funding Source
Pediatrics - LCPS	Boston Children's Hospital	World Bank
Internal Medicine - LCPS	Yale University / Brigham and Women's Hospital	U.S. Health Resources Services Administration World Bank
General Surgery - LCPS	Mt. Sinai Medical School	World Bank
Obstetrics and Gynecology - LCPS	Mt. Sinai Medical School	World Bank Private funding
Pre-clinical education - AMD	Yale University / Brigham and Women's Hospital	U.S. Health Resources Services Administration World Bank

Funders listed above are covering majority of resources necessary to develop programs but critical gaps remain that PEER can leverage to ensure success of existing partnerships and programs.

By coordinating PEER efforts with an existing academic partner U.S. medical school or research institution, the LCPS and AMD will be able to leverage funds to achieve more and access the vast faculty expertise and academic resources available at these institutions. Many U.S. academic institutions have faculty that specialize in supporting low- and middle-income countries on capacity building and developing sustainable models for training high quality healthcare providers and medical faculty members. The faculty participating in the Liberia HWP will draw from the resources and faculty within these successful training and educational programs as models for training program structure, curriculum development (but with a bias for curricula relevant to the Liberian environment), and faculty development. Additionally, residency program directors and medical curriculum experts from U.S. academic institutions will be requested to serve as consultants to lend their expertise and assist with the strengthening of infectious disease education within the current five core specialty programs and clinical training of medical school.

U.S. academic partners will also be able to provide mentoring and program support to build up the clinical research capacity at LCPS and AMD. A major value add of partnering with existing U.S. academic partner institutions is to support the strategic planning process and the training of the next generation of Liberian clinical and translational scientists. These institutions bring a robust infrastructure that will promote innovative and collaborative research directed at improving patient care. Efforts will be made to develop the clinical research capacity of medical students at AMD where they can build a solid foundation as they transition into their post-graduate work. Specifically, activities will be initiated that allow residents and students to access potential sources of funding for clinical research and other partnerships that may be available. LCPS has begun engagements with the National Institutes of Health's PREVAIL project and will continue to seek out opportunities to expose residents and medical students to the work being done at JFK Medical Center. Examples of

potential collaboration will be lectures from lead researchers at PREVAIL on research methodologies as well as PREVAIL mentorship of medical students' research projects.

As part of the HWP, technical assistance is being placed at both LCPS and AMD in order to ensure adequate coordination among education institution stakeholders. PEER funding will be leveraged so that both institutions have the capacity to proactively manage all interventions being conducted - with funds from the World Bank and the U.S. Government - in a harmonized way. Many synergies will exist with the various partners and funding mechanisms and it will be vital that LCPS and AMD work with the U.S. academic institution to build capacity to manage the various activities and administrative duties under this grant.

Through PEER, LCPS is seeking to augment existing partnerships with U.S. academic institutions with experience in supporting post-graduate medical training programs in low-resource settings with emphasis on training high quality residents, sustainability of residency programs by training local faculty, enhancing the organization of medical education, and supporting evidence-based clinical training.

U.S. academic partners would be expected to do the following:

- Provide department-specific and interdepartmental technical and educational expertise to inform or develop programs to improve the quality of post-graduate medical education in Liberia
 - Recruit, hire, deploy, and provide continuing support to Core and Subspecialist Visiting Faculty to fill faculty gaps in the short and medium term.
 - Provide technical and educational expertise as needed to inform or develop programs to improve the quality of the faculty training and educational delivery. This may include, but is not limited to:
 - Providing support in technical writing
 - Providing guidance on new teaching methods or materials
 - Conducting mentoring activities for students
 - Supporting continued development of evaluation tools and performance evaluations
 - Advise on educational standards as requested (e.g. core competencies, professional licensing and regulations, skills labs equipment, computer lab equipment, clinical training equipment)
- Support development or revision of programs and curricula and strengthen existing curricula
 - Support the revision of current curricula in line with West African Post-graduate training program framework and standards
 - Including coordination with external and/or internal reviewers of curricula
 - Support the development of new curricula (e.g. for Family Medicine) and future LCPS programs (i.e. subspecialties)
 - Provide other curricular resources as needed
 - Strengthen existing curricula by incorporating new competencies or pedagogical innovations, such as:
 - E-learning materials and curriculum integration
 - Simulation laboratory training
 - Interdepartmental and department specific quality improvement practices
- Support establishment of faculty development programs including clinical instruction and supervision for existing and new Liberian and Visiting Faculty
 - Faculty Development programs

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- Create faculty development program and plan
- Create Continuing Professional Development (CPD) programs focused on clinical (and pre-clinical) education and supervision
- Development of instructional programs for new and existing faculty
 - Formal clinical preceptor training
 - WACP and WACS qualifying exam preparatory modules for residents
 - Mentoring program on pedagogical methodology for classroom and clinical faculty
- Support operational systems development and management
 - Identify needs and leverage resources to build and maintain operational systems, particularly for interdepartmental coordination
 - Inform operational best practices for transition from clinical care-oriented hospitals to teaching-oriented hospitals
- Support expansion of academic network and continuity of partnerships
 - Identify opportunities and funding for collaborative research
 - Identify funding sources to facilitate resident and faculty exchanges
 - Develop partnerships with additional academic partners, particularly in the African region

In the long-term the academic partnerships are expected to facilitate collaborative academic and clinical research opportunities, faculty and resident learning exchanges, the development of an international partnership network, and supporting LCPS in mobilizing additional resources to support the post-graduate medical residency training in resource-limited Liberia.