



GLOBAL VISION ARTICLE

Global Health Leadership Pathway: A Novel Approach to Global Radiology Curriculum Integration for Residents

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Abstract

Purpose: Our radiology residency programs are at an academic medical center in the southeastern United States and are accredited by the Accreditation Council for Graduate Medical Education (ACGME). During the initial eight years of our department's global health program, 22 residents participated in our global health collaborations with a related \$31,000 in extradepartmental travel awards. Increasingly, residents applying to our program convey interest in the integration of global health into their careers as radiologists. To that end, our administration, global health faculty, and residency program directors created and approved a Global Health Leadership Pathway (GHLP). The Pathway spans all years of radiology training to provide curriculum support with the aim of ensuring that our residents have the knowledge and skills necessary to become future leaders in global health.

Description: The GHLP is a residency track that residents apply to join with a related radiology clinical education, global health specific curriculum throughout all training years, integration of the RAD-AID Certificate of Proficiency in Global Health Radiology, individual mentorship, and participation with an international elective. Structured education on global radiology, epidemiology, access implications, and related methodologies give our residents the opportunity to learn best practices for sustainability in global health.

Conclusion: Because of increasing interest and due to the past successful involvement of our radiology residents in global health, our department created this Global Health Leadership Pathway to give our trainees the educational resources to support their future leadership and involvement in the academic field of global health.

Introduction

Global health, including radiology, addresses issues that transcend national boundaries, places emphasis on solutions that require global cooperation, considers the impact on individuals and populations, and promotes health equity with multidisciplinary innovation [1]. During the past ten years, radiology has been involved increasingly in the academic field of global health. Many departments have created international electives and educational support for residents with an interest in global health. We reviewed the literature on these models and their features to create a pathway for our department. At the University of California, Los Angeles, Pool and colleagues established a pathway with international electives and additional ultrasound education for residents [2]. Tahvildari, Wood, and Chang document the process for creating an international elective for radiology residents with measures for safe travel and collaborative learning [3-5]. Kline and Johnson observe the growth and strengthening of radiology's role in global health over time [6-7]. Davis et al. discuss the benefits of an interprofessional collaboration, including radiologists, technologists, and other professional scopes, for a holistic approach to program development [8].

Our radiology residency programs are at an academic medical center in the southeastern United States and are accredited by the Accreditation Council for Graduate Medical Education (ACGME). During the initial eight years of our department's global health program, 22 residents participated in our global health collaborations with a related \$31,000 in extradepartmental travel awards. Increasingly, residents applying to our program convey interest in the integration of global health into their careers as radiologists. To that end, our administration, global health faculty, and residency program directors created and approved a Global Health Leadership Pathway (GHLP) spanning all years of radiology training to provide curriculum support with the aim of ensuring that our residents have the knowledge and skills necessary to become future leaders in global health. We agree with the vision described by Lungren and Hussain that structured education and curricula on global radiology are necessary for successful collaboration and for sustainable interventions that increase access to radiology services worldwide [9].

Description of Global Health Leadership Pathway

The GHLP is a residency track with mentorship, targeted curriculum throughout all training years, and project integration for residents of our department. Structured education on global radiology, epidemiology, access implications, and related methodologies give our residents the opportunity to learn best practices for sustainability in global health. Currently, our department supports existing RAD-AID regional programs so that our residents complete objectives to advance established programs [10]. RAD-AID International is a 501(c)(3) non-profit charity with the mission

of improving "access to medical imaging and radiology in low resource regions of the world to increase radiology's contribution to global public health initiatives" [11]. We do not support one-off projects; rather, we provide education to our trainees on the creation of sustainable initiatives with measurable deliverables [10, 12]. While our partnerships feature bilateral educational aims, exchange observerships, and joint collaborations, this manuscript primarily details the structure of our GHLP track.

What makes this residency track unique?

The GHLP has clear eligibility requirements and several unique features that integrate global radiology education throughout the pathway. During each year of training, there is related radiology clinical education, global health curriculum, and direct mentorship.

Eligibility and Application

In January of the first radiology training year (R1), residents interested in the pathway declare an interest and apply for admission to the GHLP. Applicants submit a personal statement that discusses why the resident would like to be part of the GHLP and how the resident intends to apply this training to their career longitudinally. These essays are blinded and evaluated by the global health faculty.

At the time of this publication, a maximum of four diagnostic radiology (DR) residents and a maximum of two interventional radiology (IR) residents are accepted into the GHLP per class. These acceptance caps are related to the maximum amount of time available for international electives while balancing the residency scheduling, radiology curricula, and patient care volumes for this institution.

Eligibility to apply for and to remain on the GHLP includes 1) completing the pathway admissions process, 2) maintaining good academic standing on radiology curriculum without remediation per residency program evaluation metrics, 3) complying with health system policies, 4) completing curriculum requirements of the GHLP, 5) completing our School of Medicine's travel procedures, 6) completing our School of Medicine's Graduate Medical Education (GME) international elective requirements, 7) understanding the elective in which the resident will participate, and 8) agreeing to complete educational objectives during the international elective that contribute to overall program progression for sustainable human capacity development per the context of that location.

Currently, the GHLP primarily supports the RAD-AID regional programs of RAD-AID Malawi and RAD-AID Kenya. Additionally, our residents can participate in efforts to improve health equity within our state. Most residents will complete the GHLP international electives in these three locations.

- In Lilongwe, Malawi, we are supporting a Malawian physician to complete radiology residency in South Africa and a Malawian radiographer to obtain an

ultrasound degree in Uganda. Both will return to work in Malawi, which will increase local expertise and capacity. Additionally, we provide education (didactic and hands-on) to increase the ultrasound skills of the local imaging technologists. Finally, we work with other departments, like pediatrics and surgery, to teach and promote relevant imaging appropriateness criteria.

- In Nairobi, Kenya, we have partnered with the University of Nairobi to establish an IR fellowship – the nation's first. Our IR faculty and staff provide education (hands-on, simulation, and didactic) for Kenyan radiologists, technologists, and nurses. During 2020, the IR fellowship received approval, and the application period is open for the first Kenyan IR trainees.
- In our state, we seek 1) to understand access barriers for our region and 2) to create solutions that deliver more equitable care for all. We strive to optimize our own processes within our Department of Radiology, and we work with local partner organizations to increase community engagement through education.

If a resident has a strong, well-supported case for involvement in another RAD-AID regional program (for example, existing research or prior program involvement) and if GME supervision requirements can be fulfilled for that location, then the global health faculty will discuss such options with departmental leadership and program directors on a case-by-case basis.

GHLP Tiers

The GHLP has two tiers: 1) The GHLP with RAD-AID Certificate of Global Health Radiology, which includes an international elective for IR and DR residents on the pathway, which are two weeks and four weeks respectively, and 2) the GHLP with RAD-AID Certificate in Global Health Radiology and with international electives spanning more than one full block. The second tier has additional requirements related to production of scholarly activity, as this tier is intended for residents with interest in developing a career in global radiology. Accordingly, individuals choosing this track are expected to produce scholarly projects, such as a published manuscript, abstract presentation or poster submission. To complete tier two, the resident must express an interest specifically in that tier. Prior involvement in global health or demonstrated scholarship production are recommended, but not required.

GHLP Related Radiology Clinical Education and Global Health Curriculum

As in other existing global health residency programs, the GHLP has an additional focus on learning ultrasound [5]. All residents in our program have ultrasound simulation labs in which they are taught to perform several studies on simulated patient adult and pediatric volunteers. Specialized exams that are less frequently encountered in our geographical region are reviewed in these simulation labs, where the resident has the opportunity to learn them and perform them independently with supervision.

Additionally, all residents have an ultrasound passport as first and second year radiology residents where they have a list of the different types of studies that they are expected to know how to perform, such as routine abdominal ultrasound. For each of the listed studies, they must observe one, perform at least one with assistance, and perform a minimum of one independently while supervised. Finally, GHLP residents must complete dedicated time in echocardiography, complete a dedicated pediatric scanning lab, and complete Focused Assessment with Sonography for TB-HIV (FASH) and Focused Assessment with Sonography for Trauma (FAST) lectures and simulation labs.

The GHLP incorporates quarterly global health noon conferences and quarterly global health journal clubs. These educational opportunities focus on tropical diseases and pathologies endemic to the global health partnership locations. The purpose of this component of the curriculum is to help prepare residents for the types of pathologies and clinical knowledge needed for their future international electives. As an additional feature, radiology colleagues and residents from our global health partnerships in Malawi and Kenya are invited to participate in these events alongside our residents. Completion of the related radiology clinical education and global health curriculum are required annually after entry into the GHLP.

The conferences balance a combination of interactive learning activities, didactic lectures, and case conferences using images from partner sites that have been compiled into a departmental learning bank. Examples of conference topics include reviewing neuroradiology and pediatric case studies with endemic pathologies, which our previous residents brought back from their international electives. During interactive GHLP conferences, we review case studies of actual global health program implementation in a small group discussion format. Residents can share their insights and receive positive reinforcement via formative feedback from the facilitating faculty member. Other topics include cultural competency, ethics of global health, and communication skills.

GHLP residents are encouraged to attend the monthly Global Health Forum offered by our School of Medicine's Office of Global Health Education. This series features medical student, resident, and faculty involvement in global health with the intention of fostering "an interdisciplinary learning community" [13]. Additionally, our faculty and residents collaborate closely on program design with our colleagues in the Departments of Pediatrics and Surgery. This interdisciplinary approach leads to more learning opportunities for our trainees and increases our advocacy ability to demonstrate radiology's value to other specialties.

GHLP recommended textbooks, which are available through our library for residents, include:

- Gharbi HA, Lutz HT. Manual of Diagnostic Ultrasound in Infectious Diseases. Springer; 2006.
- Mollura DJ, Culp MP, Lungren MP. Radiology in Global Health. 2nd Edition. Springer; 2019.

Table 1. RAD-AID Certificate of Proficiency in Global Health Radiology components and content.

Components and Content	Rationale for Inclusion in our GHLP
Cohort Discussion Forums and Interprofessional Collaboration	<p>Open dialogue and exchange with other medical professionals,</p> <ul style="list-style-type: none"> • including participants from multiple scopes of practice (attending radiologists, private practice radiologists, radiology residents from other training programs, radiologic technologists, physicists, medical dosimetrists, informatics professionals), which gives a holistic perspective for program development • including participants from high, middle, and low-income nations, which allows for the inclusion of global insights and ideas. <p>Within our global health programs, GHLP residents travel and participate on teams with our faculty, technologists, and nurses so they can experience the benefits of a holistic, interdisciplinary approach to global radiology.</p>
Defining Concepts of Access and Availability; Related Global Health Medical Ethics	<p>The course offers published literature and data (including findings from the World Health Organization) that demonstrate access to radiology equipment and available human capacity globally, which can help our residents understand the scale of inequity in access to care. The content explores ethics related to participation in global health and provides a framework for discussion of challenging medical ethics case studies.</p> <p>Additionally, our faculty support this content further in our GHLP with conversations regarding the dynamic of access and availability, with consideration for related factors and potential systemic solutions. For example, just because the equipment is available in a nation does not mean that it is accessible for everyone to use.</p>
Methodologies for Sustainable Program Development and Project Planning	<p>First, the course features discussion of relationships as foundational in global radiology.</p> <p>Then, participants learn about RAD-AID's Radiology Readiness Assessment as a baseline tool for obtaining an objective starting point in program development. Data collection include economic factors, local policy and legal consideration, cultural appropriateness, continuum of care and availability of other services, education for human capacity development, etc. [10].</p> <p>The next step in methodology is working within those established relationship to consider program goals that increase access to radiology with an emphasis on local stakeholder buy-in and on sustainability.</p> <p>Knowing the starting point and the goals creates 1) a structure for program evaluation and 2) a feedback mechanism among the partners to continually improve the partnership and to strengthen the relationships.</p> <p>Our GHLP residents witness first-hand how our department uses this methodology in our participation with RAD-AID Malawi and RAD-AID Kenya; therefore, they learn a methodology that they can use in their future global radiology work. Additionally, we work with our residents on the practices of cultural humility and cultural competency so they have mentored experience and guided practice on these critical areas throughout the GHLP.</p> <p>Our GHLP residents use their international elective to meet the RAD-AID Certificate of Proficiency in Global Health Radiology's requirement for project planning and execution. This synergy allows for the resident to complete an objective in a global health program that advances an existing partnership forward.</p>

Complexities of Capital Investment and Equipment in Global Health	<p>Participants in the course learn about best-practice methodologies for building and supporting local supply chain development and learn about leveraging innovative solutions, such as public-private partnerships, for local procurement (as opposed to donation). Additionally, concepts like the importance of service and maintenance contracts, the best approaches for donations, and related factors are explored.</p> <p>Through the course, our GHLP residents learn about the impact of equipment limitations (early end-of-life because no service and maintenance contracts, rooms of stored non-functioning equipment, etc.) so that they understand the importance of best practice procurement and local supply chain development in global radiology.</p>
Cutting-Edge Concepts, like the possibilities of artificial intelligence in addressing access disparities.	<p>The RAD-AID Certificate of Proficiency in Global Health Radiology has a module that introduces ethical areas to consider for the use of artificial intelligence in global health, such as data storage and national laws, anonymization of images, data ownership, and the importance of clear education to ensure equitable collaboration.</p> <p>We use our journal club time and interactive conferences to further explore these topics.</p>

- Palmer PES, Reefer M. *The Imaging of Tropical Diseases*. Springer; 2001.

The quarterly GHLP journal club pulls from the current literature so that our global radiology curriculum can address and discuss recent trends and initiatives. The purpose of our journal club is for residents to have direct interaction with the global health faculty, to develop mentorship relationships, to increase knowledge about global health by considering current literature, and to learn together in a safe space. The GHLP journal club is open to faculty, staff, residents, and medical students. These guidelines and structure have been created to support the mission of this journal club:

- GHLP journal club is held quarterly and is listed on the resident conference schedule.
- GHLP residents are expected to attend this journal club, but it is open to all residents.
- All residents and individuals that attend GHLP journal club are expected to read the article and to participate.
- Respectful and constructive dialogue will be used during GHLP journal club.

GHLP journal club is in a discussion, roundtable format (not a lecture style). We have a facilitated discussion with active learning in which all members contribute. For example, we use the “think, pair, share” methodology and Socratic methods of discussion. In “think, pair, share”, members are put into pairs within the group. Each pair will be given a question. Initially, the members within the pair will consider the question quietly themselves. Then, they will discuss their thoughts with the other individual in their pair. Finally, the pair will share their combined response with the group [14 – 16].

RAD-AID Certificate of Proficiency in Global Health Radiology

A requirement of the GHLP is completion of the RAD-AID Certificate of Proficiency in Global Health Radiology [17]. We chose to integrate this requirement into our GHLP because we believe the content highlights the multifaceted nature of global health that goes beyond clinical knowledge (Table 1). We believe that this educational resource will better prepare our residents to be thoughtful leaders in this academic field of study throughout their careers.

Direct Mentorship: Leadership and Global Health

To emphasize the leadership development component of the pathway, requirement of participation includes at minimum two mentorship meetings annually – one meeting with the Director of Global Radiology from our Department of Radiology and the other meeting with a second global health faculty advisor also from our Department of Radiology. Additionally, the residents of the GHLP are evaluated annually by both faculty members to ensure that they are maintaining the requirements of the pathway (Table 2). Through this mechanism, we can provide individual support to the resident and develop a tailored plan for their global health involvement.

The GHLP faculty emphasize to residents that, if needed, adaptable and flexible approaches can be created to complete the requirements of the pathway. The trainees are first and foremost learning to be radiologists, so we work with them to create solutions to integrate the GHLP into their required residency learning. If needed, we can extend scheduling for GHLP pathway requirements so that residents can prioritize radiology curriculum. Additionally, we create opportunities for synergistic learning by providing conferences that support clinical training objectives at the same time that they teach global radiology concepts. One example is a GHLP session that reviewed the appearance of

neuroradiology computed tomography cases in Malawi and related differentials which reinforced concepts being taught during residency while preparing residents for future travel.

International Electives

The culmination of the GHLP is resident participation with international electives. In our program, these electives are scheduled after the American Board of Radiology Core exam. International electives are supervised and evaluated per ACGME guidelines, through our School of Medicine's GME Office procedures, and in compliance with our School of Medicine's Office of Global Health Education. Supervision includes participation of faculty from our Department of Radiology on the electives, signed program letters of agreement with partnering institutions, and access to radiologists in our department from all subspecialties as a resource if a question arises during an elective on which our supervising attending would like consultation. As shown in Table 3, the international electives are evaluated using a standard, required evaluation based on the ACGME milestones provided by our School of Medicine's GME Office [18].

Our School of Medicine's Office of Global Health Education has processes to ensure that residents assume indemnity for security and health and to assist with obtaining travel and evacuation insurance. Additionally, this office requires documentation that a travel medical appointment has been

completed, that the resident registers with the United States Department of State, and that the resident has completed training modules on our School's emergency plan during international travel. Finally, each resident on the GHLP is required to at least apply for an external travel scholarship. As part of the mentorship component, our faculty support residents in seeking these funding sources. Our trainees have a good success rate in obtaining extradepartmental funding awards from our School of Medicine and from professional associations, such as the American College of Radiology (ACR), the Society of Interventional Radiology, our state chapter of ACR, and from RAD-AID International grants. Our department has generated additional support revenue through donations from alumni and from our community.

Residents must establish their learning objectives with the guidance of supervising faculty and program directors. Additionally, they are required to complete objectives that advance overall program progress forward. These electives contribute within established partnerships for a sustainable impact: 1) By being in the GHLP, the residents agree to deliver at least three lectures to radiology personnel that support existing partnership objectives during the elective; 2) Additionally, they provide lectures to medical students or clinicians from other services while on-site; and 3) During the elective, they maintain a case log of procedures observed and assemble two case-based lectures to use in didactic sessions after returning. Examples of topics on which our

Table 2. Global Health Leadership Pathway annual evaluation.

Resident Name:
Date of Evaluation:
Faculty Name:
<p>1. Does the resident participate in required GHLP activities (quarterly noon conferences, quarterly journal clubs, annual meetings)?</p> <p>a. Yes</p> <p>b. No</p> <p>c. Comments and suggestions</p>
<p>2. Does the resident have a plan for completion of the RAD-AID Certificate of Proficiency in Global Health Radiology?</p> <p>a. Yes</p> <p>b. No</p> <p>c. Comments and suggestions</p>

Table 2. Global Health Leadership Pathway annual evaluation (continued).

Systems-Based Practice: Physician Role in Global Public Health				
Level 1	Level 2	Level 3	Level 4	Level 5
Identifies key components of global health and related factors (economy, health system, infrastructure, etc.)	Describes how components of global health and related factors are inter-related and how this impacts patient care	Discusses how individual practice affects the broader global health progression (e.g. equipment donation versus strengthening local supply chain)	Manages various components of global health within an existing partnership to impact progression forward (applying knowledge)	Leads global health partnership with consideration for related factors to advance radiology access systemically
Comments:				
Interpersonal and Communication Skills: Culturally Appropriate and Inclusive Communication				
Level 1	Level 2	Level 3	Level 4	Level 5
Accurately communicates own role within the health care system Identification of four cultural dimensions	Identifies barriers to Effective communication (e.g., language, health literacy, cultural) Self-identification of ranges in cultural dimensions	Identifies biases that hinder effective communication Awareness of ranges in cultural dimensions of partner nation	Actively minimizes communication barriers Articulation of methods and application of strategies to shift in communication approach based on cultural dimensions	Coaches other learners to minimize communication barriers Coaches others on application of cultural dimensions for effective communication
Comments:				
Medical Knowledge: Diagnostic Knowledge (to be completed by physician global health faculty leads)				
Level 1	Level 2	Level 3	Level 4	Level 5
Makes core observations, formulates differential diagnosis and recognizes critical findings Demonstrates knowledge of pathophysiology of disease processes endemic in global health partnerships	Makes secondary observations, narrows the differential diagnosis and describes management options Applies knowledge of pathophysiology to make common imaging diagnoses for pathologies endemic in global health partnerships	Provides accurate, focused and efficient interpretations. Provides differential diagnosis and recommends management Applies knowledge of pathophysiology to make uncommon imaging diagnoses for pathologies endemic in global health partnerships	Makes subtle observations, suggests a single diagnosis when appropriate. Applies knowledge to make common/uncommon diagnosis for pathologies endemic in global health partnerships. Integrates current research and literature with guidelines to suggest resource appropriate management in the global health setting.	Demonstrates expertise and efficiency at the level expected of a subspecialist Uses partnerships and knowledge of pathologies and resources in global health partnership to advance the field of global health.
Comments:				

Table 3. School of Medicine International Elective Evaluation [18].

<p>Overall Assessment Indicate the degree to which this resident met the overall expectations during this elective.</p>	<p>___ Completely met expectations for training level. ___ Significantly exceeded expectations for training level. ___ Significant areas of deficit. Be sure to explicitly indicate area(s) of deficit below and describe specific incidents and behaviors you observed that prompt the rating. ___ Insufficient contact. Cannot rate</p>		
<p>Resident Name _____ Department: _____ Year of residency: _____ Dates of elective _____ Elective location/Organization _____ On-Site Supervisor Name and Title: _____ Description of Elective/Project/Objectives _____ _____ Days spent on project activity _____</p>			
<p>This area to be filled out by resident</p>			
Core Competencies	Markedly Below Expectations	Meets Expectations	Significantly Exceeds Expectations
<p>Patient Care Can't rate ___ Provides effective, compassionate care during any treatment, physical exams and procedures specific to this elective. Handled any difficult situations appropriately, and conscientiously attends to health promotion and prevention.</p>	1	2	3
<p>Observed behaviors for Patient Care: Strengths: _____ Areas for Improvement: _____</p>			
<p>Medical Knowledge Can't rate ___ Demonstrates knowledge of biomedical, clinical & social sciences, and applies that knowledge effectively & with good judgment in any patient care or community health work specific to this elective.</p>	1	2	3
<p>Observed behaviors for Medical Knowledge: Strengths: _____ Areas for Improvement: _____</p>			
<p>Practice-Based Learning & Improvement Can't rate ___ Uses feedback from any supervisors, evidence and other methods to investigate, evaluate, and improve his/her own practices.</p>	1	2	3
<p>Observed behaviors for Practice-Based Learning and Improvement Strengths: _____ Areas for Improvement: _____</p>			

Table 3. School of Medicine International Elective Evaluation [18] (continued).

Interpersonal & Communication Skills Can't rate ____ Establishes therapeutic relationships with patients and others on the health care team, listens effectively, elicits & provides information skillfully, & functions effectively as a team member.	1	2	3
Observed behaviors for Interpersonal & Communication Skills Strengths: _____ Areas for Improvement: _____			
Professionalism Can't rate ____ Behavior conveys respect and integrity, dedication to role as a member of the health care system, commitment to ethical principles, and sensitivity and responsiveness to all patients irrespective of culture, age, gender or disability.	1	2	3
Observed behaviors for Professionalism Strengths: _____ Areas for Improvement: _____			
Personal Integrity Can't rate ____ Demonstrated appropriate commitment and personal learning initiative during the elective, by being available for all scheduled work, being flexible in fitting in to an international context, and following expectations set for a student on a visiting medical elective.	1	2	3
Observed behaviors for Personal Integrity Strengths: _____ Areas for Improvement: _____			

Table 4. Examples of topics on which our residents delivered lectures during 2019 international electives.

Topic	Local Audience
Basics of Chest Radiography in Trauma	Medical Students on Surgery Rotation
Cranial Ultrasound	Radiology Department Personnel
Interventional Radiology Case-Based Review	Radiology Residents
Introduction to Abdominal Radiography	Medical Students
Introduction to Chest Radiography	Medical Students
Introduction to Medical Ultrasound: Anatomy, Scan Planes, and Technique with cases	Radiology Department Personnel
Lymph Node Evaluation in Pediatric Patients	Radiology Department Personnel
Management of Gastrointestinal Bleeding	Radiology Residents
Mentice Simulator Hands-On Sessions	Radiology Residents
Pediatric Fractures	Medical Students on Surgery Rotation
Ultrasound: Physics including cases with artifacts	Radiology Department Personnel

residents have delivered lectures to local radiology personnel and medical students can be found in Table 4. At the time of submission, we have begun our GHLP and have four residents enrolled currently.

Conclusion

Because of increasing interest and due to the past successful involvement of our radiology residents in global health, our department created a residency track with related radiology clinical education, global health specific curriculum, integration of the RAD-AID Certificate of Proficiency in Global Health Radiology, individual mentorship, and participation with an international elective. Having a global radiology pathway that includes a certificate of proficiency from RAD-AID International in combination with departmental global radiology curriculum is a novel approach based on current findings in the literature. We created this Global Health Leadership Pathway to give our trainees the educational resources to support their future leadership and involvement in the academic field of global health.

Conflicts of interest

The authors report no conflicts of interest.

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