

# Survey of Global Health Education and Training in Pathology Residency Programs in the United States

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## ABSTRACT

**Objectives:** This study assessed the prevalence, general interest, and barriers to implementing global health curricula in pathology residency programs.

**Methods:** We conducted a survey of 166 US pathology residency programs.

**Results:** Thirty-two (195) of 166 programs responded. Of these, 13% have a formalized global health program ( $n = 4$ ), and the majority indicated at least some general interest in global health among trainees (88%,  $n = 28$ ) and faculty (94%,  $n = 30$ ), albeit at a low to moderate level. Funding limitations, regulatory constraints, and insufficient knowledge of global health were frequently cited barriers to developing a global health program.

**Conclusions:** Few US pathology departments incorporate global health education into postgraduate training. The importance of pathology in global health has been underappreciated, despite its critical role in the delivery of health care in resource-limited settings. One solution is for pathology departments to expand global health educational opportunities for trainees.

There is growing interest in global health education programs among the current generation of medical trainees.<sup>1,2</sup> In 2018, approximately 26% of graduating medical students reported participation in a global health experience during medical school,<sup>3</sup> and medical students are increasingly choosing residency programs based on the availability of global health opportunities.<sup>4,5</sup>

Benefits cited by residents and fellows who have participated in global health programs include working with and learning from local clinicians, practicing with limited resources, building confidence in clinical skills, diagnosing and treating disease entities that are not endemic to high-income countries (HICs), developing cultural competency, and having broader exposure to social determinants of health.<sup>6–8</sup> Consequently, most graduate medical education programs in the United States are integrating global health curricula into residency and fellowship training.<sup>2,9</sup>

Currently, the proliferation of global health programs has occurred predominantly in the primary care specialties of pediatrics, internal medicine, and family medicine.<sup>10</sup> To date, there has been no formal assessment of global health curricula in anatomic or clinical pathology training programs. This is despite increased awareness of the critical role of pathology and laboratory medicine in the delivery of health care in low- and middle-income countries (LMICs).<sup>11,12</sup> This article describes results of a survey we conducted to gauge the prevalence of global health programs, the impediments to implementing such programs, and the general level of interest in global health among faculty and trainees in US pathology departments.

**Table 1**  
**Survey Questions for Pathology Residency Program Directors**

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How many residents are in your department's training program?

Does your pathology department currently have a program in global health for trainees and/or faculty?

What is the general level of interest in global health among pathology TRAINEES (residents and fellows) in your department?

What is the general level of interest in global health among pathology FACULTY in your department?

What is the general level of interest among your residents and fellows in participating in elective rotations in global health pathology, if they were offered this opportunity?

How often have applicants to your residency and/or fellowship training programs asked about global health opportunities in your department?

Are you or any of the FACULTY in your department currently actively engaged in any health projects/activities (in pathology or other areas) in other countries?

Are any TRAINEES in your department currently actively engaged in any health projects/activities (in pathology or other areas) in other countries?

How many residents and fellows in your program have had the opportunity to participate in a global health program or activity (eg, clinical, research, or other type) over the past 5 years?

If you implemented a global health pathology education program, how would it most likely be set up?

If your department offered a rotation/elective in global health pathology, in which year(s) of training could it most feasibly be accomplished?

If your pathology department initiated a rotation or elective (other opportunity?) in global health pathology for your trainees, would it likely be in the field of:

How helpful would it be for you or your department to belong to a group or consortium of pathology departments interested in promoting global health pathology training among trainees and/or faculty?

What are the top 3 constraints in your pathology department to developing a program in pathology in global health? (Select up to 3 highest constraints.)

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## Materials and Methods

The Education Committee of the American Society for Clinical Pathology Partners for Cancer Diagnosis and Treatment in Africa Initiative developed a 14-question survey **Table 1** to determine the prevalence of global health education and training programs, impediments to implementing such programs, and general level of interest in global health among faculty and trainees in US pathology departments. Survey questions were all in multiple-choice format. Two of the 14 questions provided an opportunity for open-ended comment.

An invitation to participate in the web-based survey was distributed by email to program directors of all 166 Accreditation Council of Graduate Medical Education (ACGME)-accredited pathology residency programs using the Association of Pathology Chairs Residency Program Directors Section email list. The survey was available to respondents for a 4-week period with email reminders sent on a weekly basis. At the end of the survey period, anonymous responses were collected and tabulated using the Key Survey platform.<sup>13</sup> We subsequently obtained details on the structure of four current pathology global health elective rotations in the United States **Table 2**.

## Results

### Program Demographics and Current Level of Participation in Global Health Activities

Responses were received from 32 (19%) of the 166 accredited pathology residency programs. The average

numbers of residents per program from each of the three pathology residency tracks were as follows: combined anatomic and clinical pathology (AP/CP), 17.25; anatomic pathology only (AP), 0.76; and clinical pathology only (CP), 0.53.

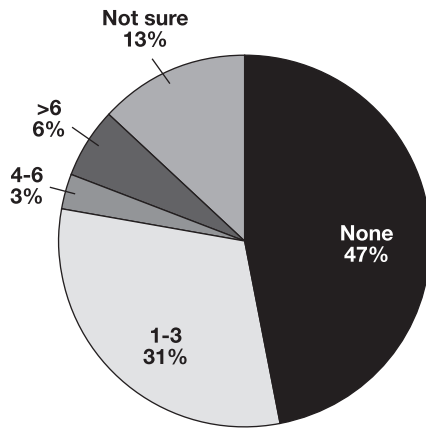
Thirteen percent of responding pathology residency programs currently have a formalized global health program of some kind in place for trainees and/or faculty ( $n = 4$ ). Forty-one percent of programs report that at least one trainee has participated in some form of global health activity within the past 5 years **Figure 1**. The proportion of programs reporting active engagement of faculty in global health activities was over twice that of programs reporting active engagement of trainees (56%,  $n = 18$  vs 25%,  $n = 8$ ; **Figure 2A**).

### Interest in Global Health

The majority of program directors indicated that there is at least some interest in global health programs among both trainees (88%,  $n = 28$ ) and faculty (94%,  $n = 30$ ) in their department, although most programs characterized the level of interest as low to moderate **Figure 2B**. Interestingly, there was at least some interest specifically in a global health elective among trainees in 94% of the responding programs ( $n = 30$ ). Half of the responding program directors reported that residency applicants have specifically asked about global health training opportunities: 14 (44%) of 32 reported occasional inquiry and two (6%) of 32 reported frequent inquiry.

**Table 2**  
**Examples of Existing Global Health Elective Rotations in Pathology**

US Institution	Host Institution	Program Type	Duration	Elective Structure	Faculty Supervision	Predeparture Training	Evaluation
Emory University	Addis Ababa University, Addis Ababa, Ethiopia	Anatomic pathology (AP)	4 weeks	Participate in grossing and sign-out of cases Deliver lectures and educational content based on needs of host institution; prior residents have given didactics on grossing technique and immunohistochemistry	In-country supervision by Emory University pathology faculty for 1 week and host institution faculty for remaining 3 weeks	Seminar with information regarding the country and university, potential ethical dilemmas, and in-country experiences of previous trainees	Evaluation from the host institution regarding sign-out and lectures given by the trainee
Vanderbilt University Medical Center (VUMC)	Kijabe A.I.C. Hospital, Kijabe, Kenya Other sites can be considered if supervision is available	AP (clinical pathology) (CP) electives can be arranged upon request	4 weeks	Daily supervised laboratory work Quality assurance (QA) project or research project Log of interesting cases	VUMC pathology faculty for entire elective	Specific training in ethics, risk management, and cultural adjustment	Trainees are required to give a departmental talk and submit the following: 1. Completed QA or research project 2. Log of interesting cases 3. Critical reflection on experience Evaluation is based on deliverables and onsite performance Trainees have a required debriefing session with program director on return
University of Washington Medical Center (UWMC)	Kijabe A.I.C. Hospital, Kijabe, Kenya	AP	4-6 weeks	Trainee staff's surgical pathology service under supervision of UWMC faculty member; tasks include grossing, previewing, and formulating a draft report; trainees can also participate in hospital tumor board Trainees can also undertake an optional QA project if interested	In-country supervision by the elective rotation director	Trainees are provided with a handbook of information on the site and country; they also meet with the elective rotation director prior to departure to discuss elective structure	Trainees are evaluated based on their performance in-country
UWMC	Naivasha District Hospital (NDH), Naivasha, Kenya	CP	4 weeks	Prior to departure, trainees collaborate with UWMC pathology faculty mentor, NDH chief resident, and NDH laboratory director to develop a laboratory QA project In-country, trainees implement project with necessary adaptations based on needs of the host institution Trainees are also encouraged to give didactic sessions for the laboratory and medical staff	In-country supervision by laboratory director and UWMC internal medicine chief resident; weekly communication with UWMC pathology faculty mentor	Trainees attend a meeting with previous and future participants from various specialties where they are given an overview of the site and resource limitations	Trainees are required to give a departmental talk Evaluation is based on their talk and feedback regarding onsite performance



**Figure 1** Number of trainees in individual pathology departments who have participated in a global health activity within the past 5 years.

### Implementing Global Health Pathology Programs

There was heterogeneity in how global health programs have been, or potentially could be, implemented among the responding institutions. Fifty-six percent of programs would set up an elective rotation ( $n = 18$ ), whereas 6% would structure the experience as a required rotation ( $n = 2$ ). Nineteen percent would require trainees to use their vacation time ( $n = 6$ ). In the majority of programs, this opportunity would be offered to trainees in their third or fourth postgraduate year. Sixty-six percent of respondents stated a global pathology elective would likely be developed in either AP or AP/CP ( $n = 5$  [16%] and  $n = 16$  [50%], respectively), whereas all others stated they were unsure at this stage. No respondents indicated a desire to create a CP-only global health elective rotation.

Constraints to developing a global health program in pathology are outlined in **Figure 3**. Funding limitations, logistical/regulatory constraints, and insufficient experience and knowledge of global health on a departmental level were the most frequently cited barriers to developing a global health program. Other factors that were listed in the open comment field included difficulty in balancing such an elective with the other ACGME and American Board of Pathology requirements as well as ensuring adequate supervision and evaluation. Seventy-eight percent of respondents stated that belonging to a consortium of pathology residency programs interested in promoting global health pathology training would be at least somewhat helpful ( $n = 25$ ).

### Discussion

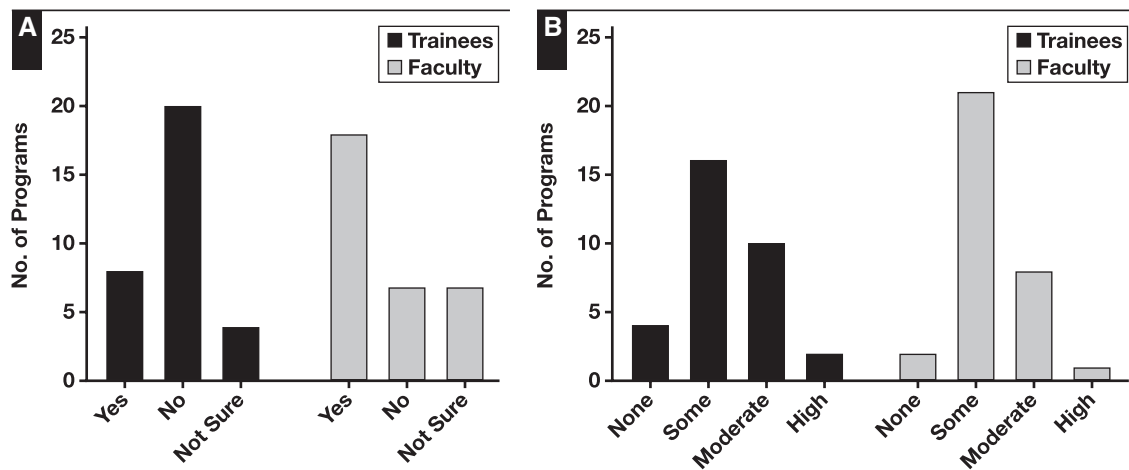
Despite growing interest and participation in global health electives among recent medical school graduates,

results of this national survey of pathology residency programs demonstrate that few US pathology departments have incorporated global health education into postgraduate pathology training. Specifically, while 41% of responding pathology programs indicated that at least one trainee has participated in some form of global health activity in the past 5 years, only 13% have a formalized global health program. Moreover, while most responding program directors said there was at least some degree of interest in global health among faculty and trainees, the majority characterized this level of interest as low to moderate. These results suggest that interest and participation in global health programs among pathology trainees and faculty may lag behind other medical specialties.

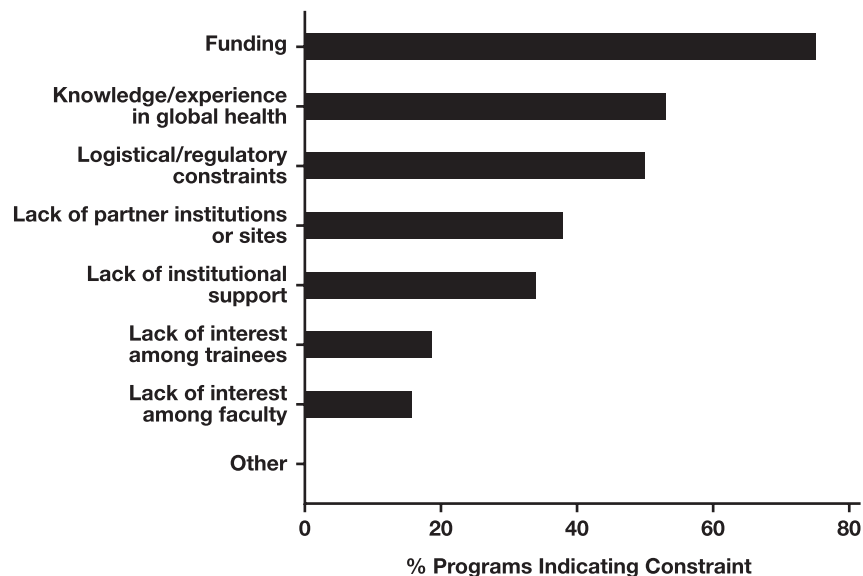
Commonly cited barriers to developing global health opportunities in pathology were funding, logistical/regulatory constraints, and lack of knowledge about global health programs. Funding and regulatory constraints, the latter in the form of ACGME requirements, are commonly cited barriers to implementing global health elective rotations in a variety of other medical specialty training programs.<sup>9,14-16</sup> Although lack of knowledge about global health programs was also a barrier, our survey results indicate that pathology faculty participation in global health activities was greater than that of trainees, suggesting that trainee rotations could possibly be structured around existing faculty activities. A survey of surgery residency programs indicated that all attending surgeons with existing global health interests were willing to engage trainees, particularly senior-level trainees.<sup>15</sup>

There is no established blueprint for developing structured global health opportunities in pathology residency programs. However, a query of three academic institutions that currently offer global health elective rotations in pathology (four total electives evaluated at three separate institutions) reveals several common themes that may provide insight into core components of a successful elective. Two of the four electives included a predeparture training and postelective debriefing designed to specifically address the ethical considerations of practicing pathology in a resource-limited setting. All four electives required engagement of a US faculty member familiar with local contexts, either directly supervising the in-country trainees or communicating regularly with the trainees during their rotation. While predeparture preparation in the form of developing teaching materials or a specific project is important, these programs also allow for flexibility to meet the needs of participating host institutions.

Any global health elective rotation in pathology must consider the ethics of practicing in a low-resource setting. Short-term global health experiences, particularly those



**Figure 2** **A**, Current level of trainee and faculty engagement in global health activities among responding programs. **B**, General level of interest in global health among trainees and faculty of responding programs.



**Figure 3** Constraints to developing a global health pathology program.

focused on clinical service, have the potential to be a “one-way street,” providing US participants with a rich learning experience while offering little in return to the host institution and its patient population. Institutions in HICs that participate in short-term global health experiences have an ethical obligation to improve delivery of health care by adequately supervising trainees abroad, bearing the financial and social costs of their trainees’ experience at the host institution, facilitating bidirectional relationships with host institutions, and promoting sustainable capacity building.<sup>17,18</sup> Creating a cultural- and resource-appropriate global health curriculum that incorporates these ethical considerations requires viable partnerships between institutions in HICs and LMICs. Unfortunately, lack of knowledge and experience in global health was

a commonly cited barrier in our survey to developing a global health pathology elective. A potential solution would be creation of a pathology training program consortium composed of programs that are engaged in global health activities and can facilitate bidirectional and collaborative relationships with host institutions in LMICs. Similar ideas have been proposed in other specialties,<sup>19</sup> and the majority (78%) of respondents to our survey indicated that they would find this type of resource at least somewhat helpful.

Limitations to the current study include a potential selection bias. Residency directors from programs with higher interest or engagement in global health activities may have been more likely to respond. In addition, there was no information collected on the responding



programs, including details about global health activities among those who indicated existing engagement. Another limitation of this study is that what constitutes a “program in global health” may have been interpreted differently by survey respondents. To exemplify what is meant by a global health program, we included models of such programs in [Table 2](#).

Future directions for research on global health in pathology postgraduate education include examination of global health opportunities in pathology departments, examination of the structure of global health electives or rotations, reflections on ethical concerns, and the establishment of bidirectional partnerships. Awareness of the educational value of global health experiences for physician trainees is growing in postgraduate medical education. Furthermore, accurate and timely diagnoses, made possible due to the provision of high-quality pathology services, are vital to the effective delivery of global health care. If pathology is to join these endeavors, it is incumbent on pathology departments to offer appropriate educational opportunities for pathology trainees in both HICs and LMICs. A step in that direction is to establish viable global health pathology programs and to more effectively integrate such opportunities into pathology training.

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