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Trainee Perspectives Regarding Advanced Clinical Global Health Fellowships in North America

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Abstract. Postgraduate clinical global health (GH) training is a rapidly evolving field. To understand and improve training opportunities, we sought the perspectives of current and former trainees related to their advanced clinical training or global health fellowships and the anticipated impact on their careers. Clinical GH fellowships across North America were identified through websites and previous studies. An e-mail was sent to program directors to invite all current and former GH fellows to complete a web-based questionnaire. We contacted 100 GH fellowship programs. Fifty-two fellows from 10 different specialties completed the survey. The median fellowship length was 23.3 months, with an annual median of 4.8 months spent in low-income and middle-income countries, which was less than their reported ideal of 6 months. The majority reported satisfaction, the anticipation of career benefits, and that they would recommend fellowship training to others. Challenges included insufficient funding, mentorship, and formal curricula. Conducting research in high-income countries was a significant negative predictor of fellowship satisfaction. Most fellows (73.1%) were not at all or only a little concerned about the absence of fellowship accreditation, with only 17.3% desiring accreditation. Survey respondents were largely satisfied with their training and valued program flexibility and educational opportunities, including advanced tropical medicine certificates or diplomas. However, to improve fellowship training, improvements are needed in mentorship, standardized curricula, institutional support, and funding. For GH fellowship training to be effective and sustainable, institutions will need to balance the needs of fellows, training programs, and the communities (low-, middle-, and high-income countries) where the fellows serve.

INTRODUCTION

There is a growing consensus regarding the importance of postgraduate medical education in global health (GH).[1,2] The discipline of GH often refers to the collaborative, transnational efforts to reduce health disparities and improve health worldwide.[3] With global infectious diseases, unrest aggravated by poverty and illness, and moral and ethical desires to assist those in need, training future clinicians to address illnesses and health disparities in our interconnected world has never been more critical.[4,5]

During the past few decades, there has been increasing trainee interest in GH and advanced postgraduate GH training opportunities.[2,6–8] In response, academic medical institutions in high-income countries, including the United States, European Union, United Kingdom, Asia, Australia, and others, have created GH competencies and curricula for their physicians-in-training.[9–16] In North America, many institutions have established GH fellowships or advanced clinical training in GH beyond traditional specialty requirements, such as residency training.[17–21] The purpose of these fellowships is typically to equip trainees with the unique knowledge and skills needed for effective GH careers.[17,22] GH fellowships, which usually involve clinical work, research, and didactics such as certificates or diplomas in tropical medicine, now exist across all major clinical specialties, including emergency medicine, family medicine, obstetrics and gynecology, internal medicine, pediatrics, surgery, anesthesia, infectious disease, psychiatry, and nursing.[22–29]

Postresidency GH training for physicians in North America was first established in the field of emergency medicine in the 1990s.[30] Since the first GH fellowships were created, there has been steady growth in these advanced training programs. A 2017 study found that the number of GH fellowships in the United States had nearly doubled since 2010, increasing from approximately 39 to 74 (an increase of 89.7%).[17] Although the number of programs continues to grow, stand-alone GH fellowships are not currently accredited by regulating bodies, such as the Accreditation Council for Graduate Medical Education (ACGME), that enable and enforce standardization of training requirements, competencies, and content across postgraduate training programs.[31–36] Similar accrediting agencies are well-established in Europe, the Middle East, Asia, and other regions.[37] However, it is our understanding that these agencies are not accrediting advanced clinical training programs in GH.

Although previous studies of GH fellowship programs have been conducted, there are no known studies that surveyed GH fellows across specialties in North America. Therefore, we sought to survey current and former GH fellows across the United States and Canada to understand their perspectives regarding the strengths of, limitations of, and recommendations for GH fellowship training. We also sought to determine which characteristics of fellowship programs were most predictive of trainee satisfaction and positive career impact. Our hope is that these findings might assist institutions and program leadership in GH education to further improve advanced clinical training opportunities and programmatic impact.

MATERIALS AND METHODS

Recruitment. We defined a GH fellowship as formal advanced clinical training in GH beyond the requirements of traditional North American specialty training, for example, either after completion of an accredited residency program or integrated with a residency program that is extended beyond a normal residency timeline.[17] Fellows and graduates of nonclinical fellowships that were solely research-based were

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excluded from this study to improve comparability among participants.

Because no academic association exists for GH fellows, and given the difficulty of identifying and contacting current and former fellows directly, we sought to recruit fellows through their GH programs. All known GH programs in the United States and Canada were contacted using their publicly available contact information, including program websites, the public GlobalHealthFellowships.org database, as well as the contact information we received directly from programs during our recent study involving 81 GH fellowship directors.[17,23]

An e-mail describing the purpose of the study and asking directors to invite all of their current and former GH fellows to complete our secure, web-based, REDCap (Nashville, TN) questionnaire using a provided weblink was sent to identified program directors. Fellows were informed that the survey was voluntary and that all responses would be kept confidential, not linked to their specific program, and only reported in aggregate. A reminder e-mail was sent to programs approximately 1 week after the initial invitation.

Online survey. The survey tool consisted of up to 38 (using skip-logic branching) closed-response and open-response questions (Supplemental Material). Authors with expertise in survey design and GH fellowship training led the survey development. Topics of the survey included the fellows' experiences during fellowships, fellowship highlights, challenges, satisfaction, recommendations for programs and future fellows, and postfellowship career activities and opportunities. We piloted the survey among six external GH educators and past GH fellows from several different institutions and revised the tool accordingly. The survey was open from June 6 to July 20, 2019, spanning the end and start of the academic school year to expectantly achieve further diversity among participants.

Data analysis. Responses were analyzed using common descriptive and inferential statistical analyses. For the qualitative data, we used an inductive approach with an emergent thematic analysis.[38] Two authors with formal training and experience with qualitative analyses initially reviewed all qualitative responses and established a list of preliminary codes. Together with a third author, they finalized the codes through several rounds of revisions and consensus-building. Finally, the qualitative data were coded independently among the trio before eventually being agreed upon through iterative revisions.

We used R (Vienna, Austria) for quantitative data analysis. For descriptive statistics, we calculated counts and percentages for categorical variables, means and standard deviations (SD) for normally distributed continuous variables, and medians and ranges for non-normally distributed continuous variables (with normality determined using Shapiro-Wilk test). We used Fisher's exact test to analyze differences in proportions. An inferential analysis focused on determining the potential predictors of fellowship outcomes measured in our survey, including satisfaction with the fellowship, the fellowship impact on career, percentage of current positions (full-time equivalent [FTE]) dedicated to GH, and current time spent working in LMICs on an annual basis.

We used logistic regression to evaluate relationships among satisfaction, impact, and GH FTE and fellowship/fellow characteristics. Answer choices for several questions (e.g., satisfaction with fellowship, impact on career) were provided using a 5-point Likert scale from "very unsatisfied" to "very satisfied." For the use of logistic regression, we dichotomized nonbinary variables using a median split. For highly skewed variables with non-normal distributions (e.g., current time spent working in LMICs), we used a quantile regression analysis.

We included age and sex as covariates for all models, and whether the respondent was currently involved in a fellowship for satisfaction and impact models. Independent variables of interest included age at the start of fellowship, whether a degree or certificate was earned during fellowship, medical specialty, GH experience before the fellowship, time spent working in LMICs before the fellowship, fellowship length, and fellowship activities (e.g., clinical activity in LMICs). Because of sample size limits, apart from covariates, we did not attempt to fit models with multiple independent variables.

Ethical review. This study was reviewed and exempted by the institutional review board of Mass General Brigham (Massachusetts General Hospital, Boston, MA).

RESULTS

We identified 100 presumptive GH fellowships. Fifty-two fellows participated in the survey: 15 (28.8%) were current fellows and 37 (71.2%) had graduated (Table 1). The mean age of the respondents was 35.0 years (range, 29–50 years), and 57.7% were female. Current fellows had been in a fellowship for a mean of 12.7 months (SD, 9.1 months), and graduates had been out of a fellowship for a mean of 5.2 years (SD, 3.4 years). There were statistically significant differences between the proportion of programs and respondents from each specialty and region, with relatively greater participation from residents in family medicine and pediatrics and in the Midwest and Northeast regions of North America (Supplemental Table 1).

Quantitative results. *Fellowship characteristics and activities.* The median fellowship length was 23.3 months (range, 11.1–47.7 months), and fellows spent a median of 4.8 months (range, 1–12 months) per year of fellowship working in LMICs. The majority (71.2%) of respondents earned an advanced degree or certificate during fellowship, with a Masters of

TABLE 1
Demographics of survey respondents

	Overall (N = 52)
Sex	
Female	30 (57.7%)
Male	22 (42.3%)
Current age, years	
Median (min, max)	35.0 (range, 29–50)
Age at start of fellowship	
Median (min, max)	30.1 (range, 27–47)
Missing	1 (1.9%)
Currently in fellowship	
Yes	15 (28.8%)
No	37 (71.2%)
GH experience	
Yes	50 (96.2%)
No	2 (3.8%)
Months of GH experience	
Median (min, max)	5.00 (range, 1–100)
Missing	2 (3.8%)

Public Health (MPH) being the most common degree (36.5%). Clinical care in LMICs (82.7%), clinical care in HICs (80.8%), and teaching in LMICs (80.8%) were the most common fellowship activities.

The majority of fellows in our study reported research engagement in LMICs. This was reported as important to fellows, with the majority wanting this experience. Almost 30% of fellows reported performing research in HICs (Table 2).

Perceptions of fellows. Broad majorities of respondents reported satisfaction with their fellowship experience, anticipated benefits for their career, and reported that they would recommend their fellowship to others. Most (73.1%) were not at all concerned or only a little concerned about the lack of accreditation by the ACGME or other regulating body, and only 17.3% desired accreditation. The median suggested that the ideal length of fellowship was 24 months, with 6 months being the median ideal time spent in LMICs during each year of fellowship. These differed only slightly, although statistically significantly, from the median actual fellowship length of 23.3 months ($P < 0.01$) and the median actual time spent in LMICs of 4.8 months ($P < 0.01$) (Supplemental Table 2).

Activities after fellowship. Clinical work in an academic medical center in HICs (70.0%), teaching in LMICs (62.2%), and research related to LMICs (45.9%) were the most commonly reported postfellowship career activities. Respondents reported spending a median of 1 month per year (range, 0–12 months) after fellowship working in LMICs and a median GH FTE of 20% (range, 0–100%) (Table 2).

TABLE 2
Activities during and after fellowship

During fellowship	Overall ($N = 52$)
Degree earned in fellowship	
Masters of Public Health	19 (36.5%)
Certificate or Diploma	11 (21.2%)
Tropical Medicine	8 (15.4%)
Other	3 (5.8%)
Masters of Science	4 (7.7%)
Doctor of Nursing Practice	2 (3.8%)
None	15 (28.8%)
Other	1 (1.9%)*
Months spent in LMICs during fellowship	
Median (min, max)	4.75 (1.00, 12.0)
Percentage of fellows who participated in:	
Clinical care in HICs	80.8%
Clinical care in LMICs	82.7%
Community-based work among vulnerable populations domestically	30.8%
Research in HICs	28.8%
Research in LMICs	63.5%
Teaching in HICs	55.8%
Teaching in LMICs	80.8%
After fellowship	Overall ($N = 37$)
Respondents currently participating in:	26 (70.0%)
Clinical work affiliated with an academic medical center in HICs	
Clinical work in private practice in HICs	5 (13.5%)
Clinical work in LMICs	13 (35.1%)
Research related to HICs	10 (27.0%)
Research related to LMICs	17 (45.9%)
Policy work related to HICs	7 (18.9%)
Policy work related to LMICs	7 (18.9%)
Teaching in HICs	16 (43.2%)
Teaching in LMICs	23 (62.2%)
Current months spent in LMICs	
Median (min, max)	1.00 (0.00, 12.0)
Current professional time in GH (%)	
Median (min, max)	20.0 (0.00, 100)

* Respondent worked toward a PhD degree that was completed after fellowship.

Predictors of fellowship outcomes. Current training status (a covariate) and research conducted in HICs were significant negative predictors of satisfaction with fellowship, with current fellows (odds ratio [OR], 0.18; 95% confidence interval [CI], 0.04–0.87) and those who participated in research in HICs (OR, 0.07; 95% CI, 0.01–0.62) less likely to report satisfaction (Supplemental Table 2). Earning a degree during fellowship trended toward significance ($P = 0.070$) as a positive predictor of satisfaction (OR, 6.15; 95% CI, 0.86–43.9); however, age, sex, GH experience, medical specialty, and spending time in LMICs during fellowship were not significant predictors. Regarding the anticipated impact on career, participation in clinical activity in LMICs (OR, 23.7; 95% CI, 2.2–261.3) and fellowship length (OR, 1.12 per month; 95% CI, 1.0–1.2) were significant positive predictors; however, clinical activity in HICs was a significant negative predictor (OR, 0.09; 95% CI, 0.01–0.98). Spending time in LMICs during fellowship trended toward significance ($P = 0.067$) as a positive predictor of anticipated impact on career (OR, 1.34; 95% CI, 0.98–1.84); however, age, sex, GH experience, medical specialty, and earning a degree during fellowship were not significant predictors. There were no statistically significant predictors for the postfellowship outcomes of current time spent working in LMICs and current GH FTE.

Qualitative results. *Choosing a fellowship.* Fellows reported several factors involved in choosing a particular GH fellowship, including desirable program characteristics, recommendations from colleagues, and individual-level factors such as geography and family (Supplemental Table 3). Survey respondents first learned about program opportunities primarily through electronic means, such as websites, electronic media, and listservs, although many respondents reported first learning about their eventual fellowship program by word of mouth from either colleagues or mentors.

Fellowship benefits. Fellows consistently reported flexibility as the main benefit of their programs (Supplemental Table 3). Colleagues were often referenced as a highlight of their experience, and that relationship-building was among the most positive features of their fellowship training. As one respondent reported, "[What I liked most about fellowship were] the relationships I developed with the local clinicians. I learned a new language and developed a deep love for a country I'd never known about before. I made some great connections with people who do incredibly inspiring work." The opportunity to work in another country was also highly prized, and some fellows stated gratitude for the freedom to choose their international clinical site. Such freedom permitted fellows to pursue "[making] a difference in a resource-limited area: Africa, where I grew up." Fellows identified learning opportunities, such as didactic lectures and practical skills sessions, as important aspects of fellowship training.

Positive and negative aspects of fellowship. We identified several themes related to program innovations and the positive and negative aspects of fellowship training. Distinctive and innovative program features reported by fellows included being interdisciplinary, being able to pursue an integrated fellowship (e.g., clinical subspecialty) at the same time, being able to pursue an advanced degree, and working with vulnerable domestic populations. Fellows most frequently cited sufficient funding and mentorship as the two most common

TABLE 3
Perceptions of fellows

	Overall (*N* = 52)
Satisfaction with fellowship	
Very satisfied	31 (59.6%)
Moderately satisfied	13 (25.0%)
Moderately unsatisfied	3 (5.8%)
Very unsatisfied	5 (9.6%)
Recommend fellowship to others	
Definitely recommend	30 (57.7%)
Likely recommend	14 (26.9%)
Neutral	7 (13.5%)
Likely not recommend	1 (1.9%)
Impact on career	
Definitely benefit	33 (63.5%)
Likely benefit	15 (28.8%)
Neutral	4 (7.7%)
Concerned about accreditation	
Not at all concerned	26 (50.0%)
A little concerned	12 (23.1%)
Unsure/neutral	5 (9.6%)
Moderately concerned	3 (5.8%)
Very concerned	3 (5.8%)
Other	3 (5.8%)
Desire fellowship accreditation	
Yes	9 (17.3%)
Unsure/neutral	16 (30.8%)
No	27 (51.9%)
Ideal fellowship length (months)	
Median (min, max)	24.0 (0.00, 60.0)
Ideal time spent in LMICs during fellowship (months per year)	
Median (min, max)	6.00 (2.00, 12.0)

items lacking in their programs. Respondents often reported experiencing isolation, fatigue, and unrest while abroad, as well as sustaining international collaboration during months at home: "I think the biggest challenge was staying engaged with sites abroad when you are at home." The majority of respondents desired knowledge about sources of funding and additional networking opportunities (e.g., with mentors, other GH fellows, nongovernmental organizations, or other departments within their home institution). One respondent requested, for example, "improved mentorship in obtaining financial assistance for programming in the future."

Suggestions for improvement. Fellows provided suggestions for improving the fellowship training experience and advice to future fellowship applicants (Supplemental Table 3). With respect to the management of GH fellowship programs, fellows suggested providing increased funding, networking opportunities, standardized curricula, additional skills training, logistic/administrative support, future employment advice, and mental health support to deal with potential psychological trauma experienced while working in settings of poverty and unrest. One respondent suggested that, although "no accreditation is necessary," it might be useful to have "more standardization" between programs. When invited to provide any advice for future fellows, respondents cautioned awareness of the logistical, scheduling, and goal-setting challenges associated with the international and cross-cultural nature of GH work. Former fellows also offered encouragement and suggested patience and flexibility as key factors for a satisfying GH fellowship.

Fellowship and GH career activities. Current and former GH fellows shared a wide variety of current work activities. Fellows reported being involved abroad in direct clinical care (including respite for other clinicians), health system strengthening, humanitarian aid, research, and program development (e.g., human trafficking prevention, quality improvement, establishing a specialty). Examples of educational activities in the United States and abroad included bedside teaching, didactic presentations, hands-on skills training, research, and the supervision of GH curricula, traveling medical students, and resident projects.

DISCUSSION

Health disparities are increasing globally, thereby increasing the need for investing in a growing generation of health professionals seeking to practice medicine in resource-limited settings, work with underserved populations, and reduce the global burden of disease. Along with the increasing interest in GH and GH training, there has been a significant expansion in the number of advanced clinical GH training programs over the past decade. To ensure and improve the effectiveness of these programs, constructive feedback from GH fellows is critical. To our knowledge, the present study represents the first-ever cross-disciplinary study among GH fellows in the United States and Canada. It included 52 current and former GH fellows from all major medical specialties, and it describes the expectations and realities of the GH fellows' experiences and suggests possible improvements to GH training.

More than 60% of participating GH fellows reported believing their fellowship would definitely benefit their careers, and an additional nearly 30% believed it would likely benefit their careers. Fellows identified several distinct features of successful programs, including flexibility, strong mentorship, focusing on vulnerable populations, and a strong educational program. Most fellows reported that an advanced degree, such as an MPH, can be a valuable component of GH fellowship training. These degrees may also provide fellowship graduates with competitive advantages both in academia and in the job market. A 2017 study by Brown et al. that examined 81 public job postings by 48 GH employers wishing to hire physicians interested in public health careers found that 27% of jobs required and 43% of jobs preferred a relevant master's degree as well as substantial GH experience beyond clinical practice.[39] Other program features that fellows sought during training included networking, leadership development, and a balanced mix of clinical work, field-based experiences, research, and didactics. Some fellows pursued programs that had a specific focus or feature, such as indigenous health or faith-based care, or programs that allowed dual specialty. Almost all fellows highlighted that during their application process, they sought programs with sufficient time abroad, where well-established connections between the program and international sites had been made.

Challenges reported by fellows included limited or lost funding, which has been a common concern at all levels of GH training in North America and other high-income regions.[2,10,17,40–48] Funding difficulties could have contributed to fellows' dissatisfaction with other aspects of their training experience, such as lack of promised opportunities to receive mentorship, unmet didactic expectations, and poor program-level communication. Insufficient faculty mentorship appears common in many GH training programs.[2,49–52]

Included in these educational shortcomings was a lack of orientation to cultural context, which is also consistent with the lack of preparation reported at other levels of training.[2,45,52–56] Fellows in our study reported a feeling of isolation, fatigue, and psychological trauma after witnessing the suffering of others. Fellows may have entered these programs with a high expectation of their impact on target populations and felt their expectations fell short.

Many fellows described the lack of instructions, curriculum, or mentorship in specific skills, such as cultural competency in international settings, as major drawbacks of their programs. Solutions include the development and implementation of cross-cultural, language, and specific contextual clinical skills training as well as competency-based curriculum for training in GH. Similar discussions have been occurring in Europe and other regions.[10–14] Although a nonclinical fellowship, one strong example of a competency-focused training program is the Fogarty International Center Global Health Fellows Program, in which trainees are encouraged to achieve eight core competencies,[36] learning objectives, and up to 58 assignments.[57] Adopting uniform fellowship competencies could allow programs to identify and correct areas of weakness in developing partnerships and fellows' skill-building.[58] Underscoring the need for greater guidance, graduated fellows involved in our study frequently reported their career paths as unclear. Some respondents reported frustration with not being able to use their fellowship-acquired training right away, or that their career diverted away from GH after graduation because of limited funding, clinical demands, family, or other important obligations.

To improve fellowship training experiences, study participants recommended improvements for mentorship, standardized curricula, institutional support, and funding. They also requested a public database of current fellowship programs and their features and a common listserv for sharing knowledge, solutions, and resources, such as curricula, protocols, guidelines, and forms. Fellows have expressed a desire for increased collaboration among fellows from different programs.[23] The majority of respondents in this study did not feel that accreditation by the ACGME or other regulating body was necessary because, according to some, the perceived impact that accreditation might have on program and fellow flexibility.[2,17] That said, on the residency level, several studies have illustrated how thoughtfully developed GH training programs can meet accreditation requirements for resident training while still allowing flexibility.[59–64]

Fellows involved in research in HICs were statistically less likely to report being satisfied with their fellowship experience than those who did not engage in research in HICs. Similarly, clinical work in LMICs during fellowship was a significant positive predictor for anticipated career impact; however, such work in HICs was a significant negative predictor. Many fellows felt that domestic research and clinical obligations limited the time available to perform GH activities abroad, which most fellows consider a central purpose for their training. Consequently, programs and fellows should be judicious when assigning and accepting domestic responsibilities during fellowship. However, we recognize that this presents an inherent challenge because most programs rely on domestic clinical revenue generated by fellows as a principal funding source.[17] As with any deployment of clinicians to resource-limited settings, programs must remain cognizant of the potential burden of trainees on hosts and plan accordingly.[65] Furthermore, education planning should aim for equity and balance of the goals of all parties of the host and home institutions, and further research of bidirectionality and the impact of global health trainees on partners and communities served is needed.[66,67] In-depth interviews may also augment the exploratory nature of this survey and help further the understanding of, for example, the association between the work of the fellows in HICs and their satisfaction with fellowship.

This study adds to the body of evidence of the perspectives and perceptions of fellows regarding their GH training, but it did have limitations. We were not able to identify current and former fellows directly; therefore, we were not able to contact them. Contacting fellows through their fellowship directors prevented the determination of a response rate or of who the nonrespondents were. Another limitation to this study was a possible selection bias because fellowship directors who felt that their programs had experienced relatively less satisfaction may have been less likely to disseminate this survey to fellows. As with any study using self-report, there was a possibility of social desirability bias and recall bias. However, we attempted to minimize the potential bias by informing participants that their responses would remain anonymous and would only be reported in aggregate. Although a public database of GH fellowships has been established, and although we attempted a thorough web search, the field is quickly evolving, and we may have missed programs, especially those that do not currently have a web presence or are not in the public database. Although the other clinical specialties and regions were approximately represented in our sample proportional to their known prevalence, emergency medicine programs, internal medicine programs, surgery programs, and programs in the South and West regions of the United States were relatively underrepresented, and family medicine programs, pediatrics programs, and programs in the Midwest and Northeast regions in the United States were overrepresented. Some programs were interdisciplinary and included nurses among their GH fellows. Because nurses have a critical role in healthcare globally, and to display the diversity of GH fellowship programs, we elected to include these GH nursing fellows in our study.

We also acknowledge that this study was conducted before the COVID-19 pandemic, which has underscored the importance of GH and significantly impacted GH training and programming. As a result, programs and their partners have needed to reassess and adjust what fellowship training and global collaborations in general can and should involve. With curtailment of international travel, for example, greater focus has been given to remote instead of in-person training, as well as to so-called glocal health, which includes serving local underserved or resource-limited populations such as immigrant or indigenous communities.[68,69]

GH fellowship training is a relatively new and evolving field. This unique survey solicited the voices of current and former fellows to develop effective training programs. Survey respondents were largely satisfied with their training and valued program flexibility, strong mentorship, and educational opportunities, including advanced degrees. Lack of resources such as funding and mentorship, poorly designed educational programming, and personal factors such as balancing obligations or dealing with psychological trauma were the most important challenges faced by the trainees. For GH fellowship

training to be effective and sustainable, institutions will need to balance the needs of fellows, training programs, and the communities that the fellows serve in both LMICs and HICs.

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