



## ORIGINAL RESEARCH

### Surveying the Current State of International Outreach in Radiology Training Programs

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#### Abstract

**Purpose:** Over the past decade, there has been an increased level of attention focused on improving radiology's contributions to global health programs in resource-restricted areas of the world. This has led to the formation of new organizations and international imaging partnerships. As a result, there have been related publications and guidelines, which has increased awareness and interest amongst current and prospective radiology trainees.

**Methods and Materials:** With this survey of residency program directors, we set out to: 1) examine current opinions of and experience with integrating international and outreach opportunities into their training curriculum; and 2) to analyze these data to inform strategies for growing opportunities within training programs nationwide.

**Results:** The majority (51%) of programs participating in the survey have interest in participating in international projects and 64% feel they add value to resident education. Only about a quarter (27%) of programs, however, have had residents participate in radiology-related international projects over the last five years, and even fewer (18.8%) have established international elective opportunities. However, the majority of programs (58.3%) have some faculty who are involved in international radiology.

**Conclusion:** The reported interest in international educational and service opportunities among residency training programs is much greater than current levels of participation. A much larger percentage of responding programs have faculty involved in international work than residents, despite the acknowledged benefits and interest.

#### Introduction

International outreach is a growing area of interest within the field of radiology, which has traditionally lagged behind other specialties in resident engagement abroad (1-5). Primary care and medical subspecialty physicians tend to dominate global health research, aid and governance, as well as

decision-making positions in state departments and ministries of health (6). This fact may contribute to medicalization of policy and inadequate solutions to radiological imaging needs (6). Recently, there has been an increased focus on addressing the gap between radiology

trainees' desire to perform outreach activities and the relative lack of available opportunities (7,8). With the timeline change in board certification implemented in 2014, there is a noticeable shift for trainees to utilize new elective/selective time liberated during the final year of training to pursue international opportunities.

The American College of Radiology (ACR) Resident and Fellow Section International Outreach Subcommittee previously described a framework to establish global health imaging curricula in radiology training programs (9). These guidelines included provisions for different degrees of global health engagement, with the idea that they can be implemented either at the individual level or at the program level, both in high- and low-resource training environments. These guidelines are necessarily broad and do not preclude modification based on nuanced needs and interests of individual radiology programs and participants. A more detailed understanding of current global radiology outreach practices at the trainee level would help facilitate efforts to address unique challenges of such international opportunities and to foster and develop additional programs. It would also help identify areas where radiology outreach at the trainee level could better interface with existing efforts, whether general, such as those of the Consortium of Universities for Global Health (CUGH), or subspecialty-specific, such as those by RAD-AID.

For further context, CUGH is an organization of over 145 academic institutions and other organizations from around the world whose mission is to build interdisciplinary collaborations to address global health challenges. CUGH promotes mutually beneficial, long-term partnerships between universities in resource-rich and resource-poor areas through its meetings, workshops and webinars, and even provides funding opportunities for various global health projects. RAD-AID's mission is to increase and improve radiology resources in the developing world. The cornerstone of RAD-AID's strategy is the Radiology-Readiness tool, which is a systematic data collection tool for assessing how medical imaging technology can be planned and implemented to best match the medical needs and infrastructure/personnel resources of a community. Among RAD-AID's many efforts are the deployment of picture archiving and communication systems (PACS) around the world and the development of an interactive online course to provide formal training in global radiology.

Organizations such as these provide great opportunities for trainee collaboration, yet, a relative lack of radiology resident engagement overseas has been reported (5,10). Ascertaining why is made difficult due to the fact that little has been documented regarding the types of opportunities and degree of program-level support currently available to residents. Information regarding resident attitudes and trends towards outreach activities is also scarce. Here, we present new data that provide insight into resident experiences with global

outreach activities, as well as potential avenues to augment the quantity, quality, and success of international imaging initiatives.

## Methods and materials

A list of all accredited diagnostic radiology residency programs from the Accreditation Council for Graduate Medical Education (ACGME) for the 2014-2015 academic year was obtained from the ACGME website\*. A survey was then created to determine the current state of international outreach programs in radiology residency training sites across the United States (US). The questionnaire was distributed via email, utilizing the online survey tool SurveyMonkey®, to chief residents and program directors at all ACGME-accredited residency programs in the United States (see Appendix 1). Participation was strictly voluntary. Response rate was 26% (48 of 185 programs). Several questions focused on determining whether the residency program had an established international elective, the location of the elective, faculty participation in global radiology, and future plans for electives. Additional survey questions attempted to gain insights on the current opinion of international electives in radiology training utilizing Likert scales.

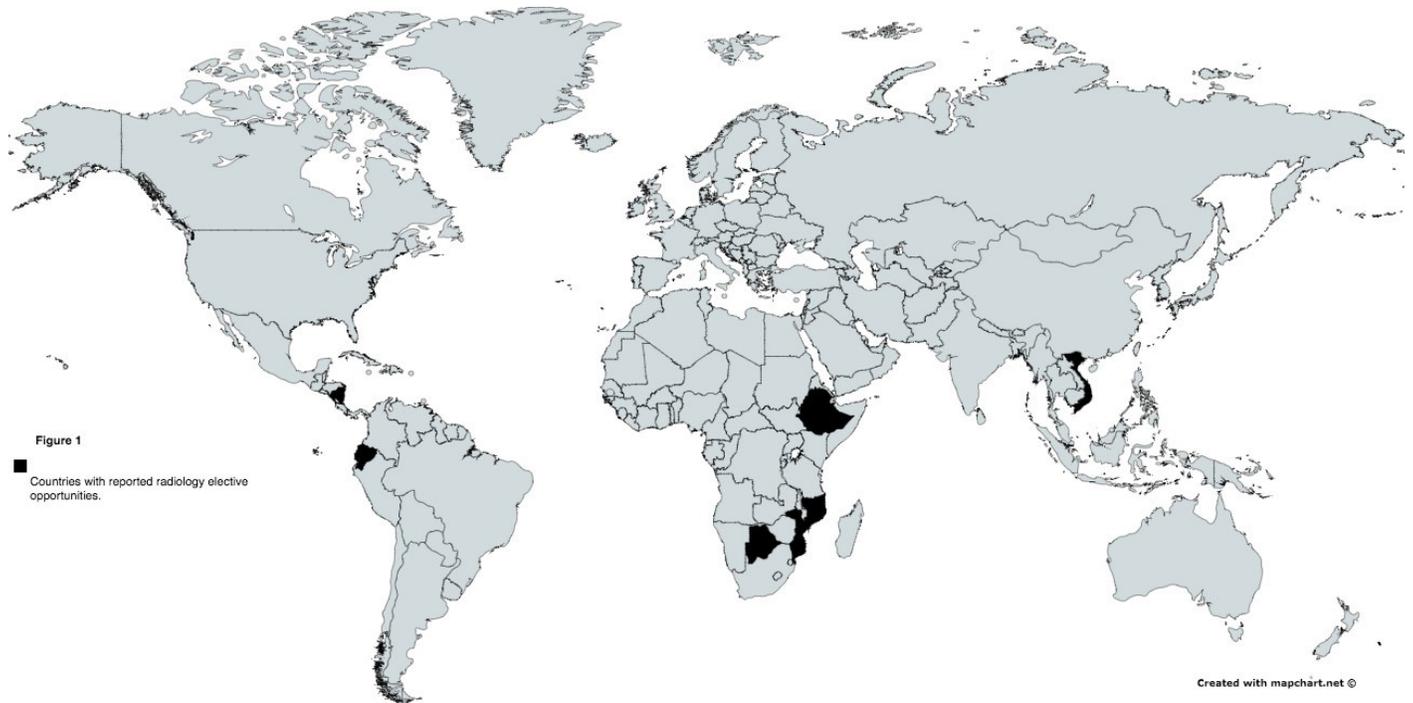
## Results

Of the 48 programs that responded to the survey, 9 (18.8%) had international elective opportunities (including clinical, research and educational) within the residency program. These programs have established rotations in countries including Botswana, Ecuador, Ethiopia, Haiti, Mozambique, Nicaragua, and Vietnam (Figure 1). The length of time the trainee spent on the international elective ranged from 1-8 weeks, with the majority ranging from 2-4 weeks. The most extensive international outreach opportunity included a global health mini-concentration during the fourth year of radiology training totaling 5 months—6 weeks of coursework in global health, 8 weeks on rotation in Botswana, 2 weeks of local service work, and additional elective time in emergency radiology. Of programs with established electives in the curriculum, 63% planned to continue the international rotation in the future.

The primary stated objective across reported international electives was education, both for trainees and faculty in the host country as well as for the visiting residents from the US. Some programs also report participating in developing new residency programs in underdeveloped countries, introducing advanced cross-sectional imaging, providing subspecialty expertise/training, and implementing infrastructure to allow image-guided procedures to be performed. One program reports providing an ongoing domestic experience throughout the course of residency training by reading radiologic studies via teleradiology as part of a collaborative relationship with an international hospital. Programs cite multiple benefits for US trainees participating in outreach programs, including exposure to

\* ACGME website: <http://www.acgme.org/>

**Figure 1. Countries where reporting radiology residency programs have established international outreach opportunities for trainees.** Figure created using mapchart.net.



unusual pathology, improvement in diagnostic skills with radiography and ultrasound, and development of teaching skills. Additionally, residents are exposed to global health topics and different health care systems.

Twenty-seven percent (13/48) of surveyed programs have had residents participate in radiology-related international projects outside of a structured elective within their program's curriculum in the past five years. Similar to the majority of internally established electives, the length of reported rotations was typically 2-4 weeks, with a primary reported objective of providing clinical care through interpreting radiographs, performing ultrasounds, and educating local radiologists.

The participation of faculty involved in international radiology varied across the 48 programs surveyed: 41.7% had no faculty involvement, 45.8% had fewer than five faculty members involved, 12.5% had five to ten faculty involved, and no programs had greater than ten faculty involved. Several questions also attempted to gauge the current opinion of international outreach electives in radiology training programs (Figure 2).

Programs were also queried regarding the maximum amount of time feasible for a trainee to dedicate to a global health radiology project or elective—23.4% stated a rotation was not feasible, 8.5% replied 1-2 weeks, 2.1% stated 2-3 weeks, 48.9% indicated 3-4 weeks, and 17% replied greater than 4 weeks. Financial support is reported to be a significant barrier to offering international electives, with only 12 programs (27.9%) reporting to have provided funds for trainees to lessen the cost of involvement in global health radiology projects.

This financial support is reported to come from professional development funds, departmental funds, international and global health programs within the institution, and salary support from the school of medicine and offices of graduate medical education. Programs also report encouraging trainees to pursue grant awards such as those provided by the ACR.

## Discussion

The survey results indicate that while a majority of radiology residency programs have an interest in participating in international projects (51%), feel that such projects add value to resident education (64%), and have significant trainee interest in global health imaging (56%); only about a quarter (27%) of programs have had residents participate in radiology-related international projects over the last five years, and even fewer (18.8%) have established international elective opportunities. Further, these percentages are discerned from voluntary reporting data, which is almost certainly affected and limited by selection bias, with programs that are more active in international work being more likely to respond. These findings suggest that there is a gap between the willingness of programs and residents to participate in international radiology and their ability to bring these desires to fruition. Interestingly, in contrast to resident involvement, a majority of programs (58.3%) reported having faculty involved in international radiology. This finding suggests that faculty have an easier time participating in international imaging opportunities than residents. Why might this be the case?

While purely speculative, one possible explanation for this

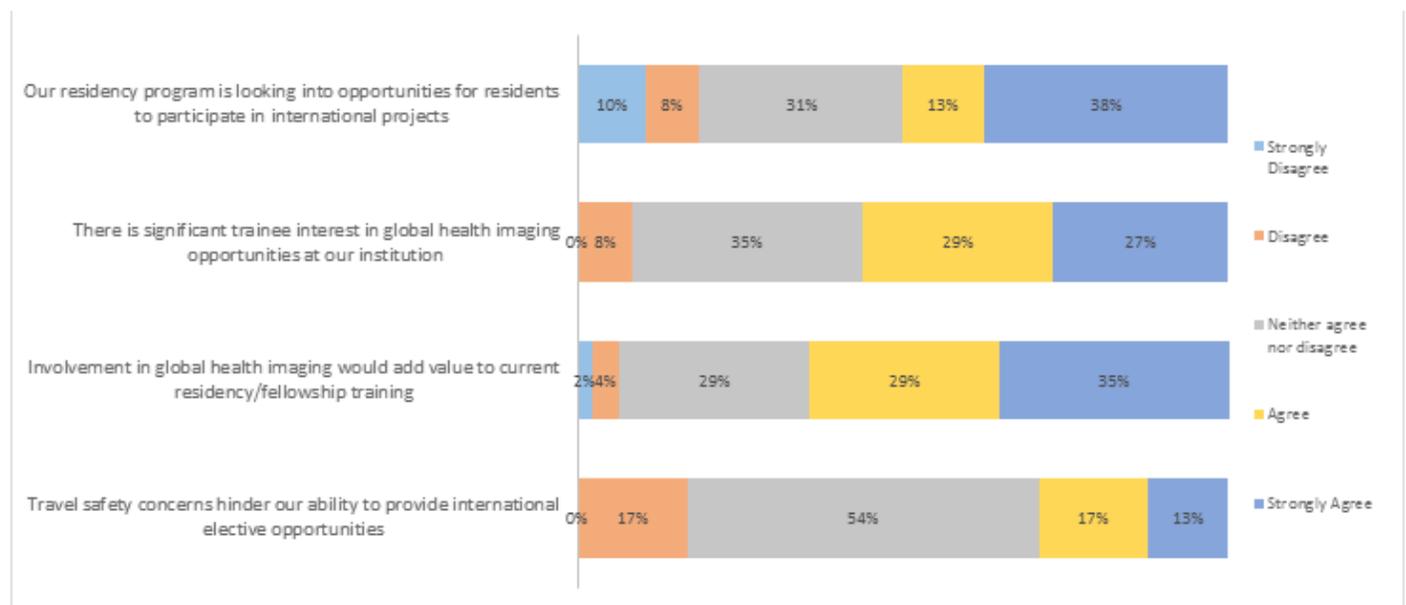
discrepancy is that radiology faculty have had more time in the field (i.e. more years spent working as radiologists) to network and identify opportunities abroad. If this is the case, improving the current international radiology information infrastructure could help residents discover opportunities sooner. For example, creating an online directory of international radiology “resource faculty” may help residents reach out when they need information about what international opportunities exist and/or need guidance on how to prepare for an international elective. This directory can be a portable document format (PDF) organized by state, by the institution faculty members are from, or by the location of international opportunities, with the name and contact information listed for the faculty member. This would allow the interested individual to contact a faculty member that is in their domestic region or who works in an international location of interest. Furthermore, as it is unclear whether the currently established international electives are operating at capacity, radiology residents may contact and find out if other programs with established international electives can accommodate them within their programs, as they would if they were visiting on an away rotation. The Massachusetts Medical Society has a similar PDF format for a list of Global Health Opportunities for Students and Residents\*. The document is divided into the specific interests an individual may have when investigating global health opportunities, such as projects to help with at home and how to fund an international health elective. Another example of an online directory is supplied by the American Academy of Family Physicians who have made a directory (<https://nf.aafp.org/Directories/internationalrotation/search>) where an individual

can search by the state international health residency programs are located in, or by the location of the opportunity abroad. Additionally, if programs truly prioritize international experience as a valuable educational supplement, efforts can be made to ensure that participating faculty engage trainees in their current efforts. One way to facilitate this is to have the participating faculty provide a lecture of their international experience to the department. Guest lecturers can also be invited to talk about their experience abroad, either from other institutions with known international health experience or other departments in the same institution. In this way, residents can see the opportunities and meaningful experiences available to them, ask questions, and network with individuals already engaged in helping abroad.

Another possible reason for lower resident participation may be the income disparity between residents and their faculty counterparts. Only about a quarter (27.9%) of programs provide funding to defray the cost of resident involvement in global health radiology projects. This suggests that lobbying for the creation or expansion of various institutional, state, and national grant programs for international radiology needs particular attention.

Additionally, the survey suggests that there is question about resident availability for outreach opportunities. While approximately two-thirds of responders did report that residents could be away from local clinical duties for up to a month or more to participate in an international elective, nearly a quarter of responders thought that any length of time would not be feasible. This is alarming, and while local

**Figure 2. Current opinions of international outreach electives in radiology training.** Visual presentation of current opinions of residency directors surveyed regarding international outreach electives. Using a Likert scale, opinion data for four relevant questions is illustrated below, with responses varying from “strongly disagree” (left most, light blue) to “strongly agree,” right most, dark blue.



\* Global Health Opportunities for Students and Residents: [http://www.massmed.org/medical-students/global-health-opportunities-for-students-and-residents-\(pdf\)/](http://www.massmed.org/medical-students/global-health-opportunities-for-students-and-residents-(pdf)/)

service responsibilities are important and not to be ignored, it is critical that they not be so overbearing that they prohibit diverse educational experiences.

## Conclusion

There is a discrepancy between the desire of radiology programs and residents to participate in international radiology and their ability to do so. Some possible obstacles to participation include a lack of topic-specific information infrastructure, high resident costs, and resident availability. Potential solutions may include creating more online resources (especially facilitating program-to-program networking), pushing for additional grant funding, and continuing to stress the value of a radiology curriculum that incorporates international outreach.

## Conflict of interest

The authors report no conflict of interest.

## Acknowledgments

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**Appendix 1. Trainee Global Health Imaging Opportunities Survey administered via SurveyMonkey\*.**

## Trainee Global Health Imaging Opportunities Survey

The American College of Radiology (ACR) Resident and Fellow Section (RFS) International Outreach Subcommittee aims to serve as a primary resource for trainees interested in global health imaging opportunities. We are interested in documenting existing opportunities for radiology residents and fellows in ACGME accredited radiology programs throughout the country in an effort to facilitate current projects and to organize future endeavors.

Your participation in this survey is important to us even if your program is not currently involved in global health outreach. If there is a more qualified individual in your program with knowledge in this area, please forward the survey to him/her. We would appreciate your response by (enter date).

This survey is designed to take five minutes of your time.

Thank you in advance for your participation.

**1a. Institution Name:****1b. How many residents are in your program?**

- <20
- 20-40
- >40

**2. How many of your teaching faculty are involved in international radiology?**

- 0
- <5
- 5-10
- >10

**3a. Do you have an established international elective opportunity (ex. clinical, research, or educational) within your residency program?**

- Yes
- No

\* Survey URL (April 2018): <https://www.surveymonkey.com/r/QNRXR59>

**3b. If yes, please describe the nature of the elective opportunity:**

**In which country or countries does the opportunity take place?**

**What is the topic/objective of the elective opportunity?**

**How long is the participant(s) allowed to be at the international site?**

**Are there plans to continue this opportunity in the future?**

Yes

No

Comments:

**4a. Have any residents in your program in the past five years participated in radiology related international projects, electives, or research outside of the elective opportunity discussed in Question 3?**

Yes

No

**4b. If yes, please describe the nature of the project(s):**

**In which country or countries did the project(s) take place?**

**What was the topic/objective of the project(s)?**

**How long was the participant(s) allowed to be at the international site?**

**Are there plans to continue this project(s) in the future?**

Yes

No

Comments:

**5. Our residency program is looking into opportunities for residents to participate in international projects**

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

**6. Involvement in global health imaging would add value to current residency/fellowship training.**

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

**7. There is significant trainee interest in global health imaging opportunities at our institution.**

Strongly agree

Agree

Neither agree nor disagree

Disagree

Strongly disagree

**8. Travel safety concerns hinder our ability to provide international elective opportunities.**

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

**9. What is the maximum amount of time feasible to dedicate to a global health radiology project for a trainee in your program?**

- Not feasible
- 1 - 2 weeks
- 2 - 3 weeks
- 3 - 4 weeks
- 4+ weeks

Other:

**10a. Does your program provide financial support to defray the cost of involvement in global health radiology projects?**

- Yes
- No

**10b. If yes, what is the nature of the institutional funding?**

**Thank you for your participation.**

If you are interested in finding out more information about global health radiology or more about our subcommittee please visit:

<http://www.acr.org/Membership/Residents-and-Fellows/Resident-Resources/RFS-International-Outreach-Subcommittee>

Done