

Frameworks for Radiation Oncology Global Health Initiatives in US Residency Programs

Benjamin C. Li, MD, MBA^{1,2}; Jessica Chew, MD¹; Daniel V. Wakefield, MD^{2,3,4}; Ankit Agarwal, MD, MBA⁵; and Anuja Jhingran, MD⁶

PURPOSE To understand trends, pathways, and experiences and to establish a framework for radiation oncology (RO) programs interested in developing global health (GH) initiatives.

METHODS An in-depth interview was conducted of all US RO programs with established GH initiatives. Programs were identified by reviewing results of the 2018 Association of Residents in Radiation Oncology Global Health Resident Survey and individualized outreach to screen for additional programs meeting the following criteria: (1) active resident involvement in RO-specific GH opportunities, (2) active faculty involvement in these initiatives, and (3) department chair or program director awareness and support for ongoing opportunities. Among 88 residency programs, 11 were identified. Standardized questions explored the type of initiative, planning, staff and resident involvement, challenges, components to success, and history of programs through December 2018.

RESULTS Between 2010 and 2018, 11 programs started initiatives. Total resident participants ranged from one to 13 (median = 3) in each program's history. Initiatives spanned education (n = 9 [82%]), clinical mentorship (73%), innovative technology (55%), bilateral hosting programs (45%), clinical development and equipment (45%), promotion of local research (36%), clinical care (36%), industry partnerships (27%), and remote tumor board (18%). Faculty involvement included radiation oncologists (91%), medical physicists (55%), and non-RO department faculty (27%). Six programs (55%) had faculty with prior GH experience. Four (36%) programs reported medical student involvement in projects. Barriers included international communication (36%), time for faculty (18%), funding (9%), and legal (9%) concerns. Commonest components of success included fostering relationships with international sites and identifying needs before solutions.

CONCLUSION RO GH initiatives were reported as positive, educational, and feasible across 11 US residency programs. Growth is expected, representing opportunities for innovation and service among US programs.

JCO Global Oncol 7:233-241. © 2021 by American Society of Clinical Oncology

Creative Commons Attribution Non-Commercial No Derivatives 4.0 License 

INTRODUCTION

Over the past 2 decades, medical training has evolved with global health (GH) pathways now available in 90% of US medical schools.^{1,2} This growth has spurred the development of postgraduate training in GH as well, with several programs focusing on areas such as infectious disease, primary care, and maternal and child health. Reported advantages from focused study in GH include increased medical knowledge,³ improved diagnostic skills,⁴ enhanced cultural humility⁵; increased awareness of social determinants of health, and greater understanding of resource usage.⁴ Furthermore, trainees who pursue GH education feel better prepared to engage in an increasingly connected global economy and respond to health system challenges.⁶

During this evolution, the field of global oncology has risen to prominence. Globally, cancer is a major source of morbidity and mortality with an estimated 18.1

million new cancer case diagnoses and 9.6 million cancer deaths in 2018.⁷ To address this rising cancer burden, improvements in screening, diagnosis, and treatment are needed. Radiation therapy is a critical component of cancer treatment, comprising the standard of care for more than 50% of newly diagnosed cancers and an effective treatment modality for palliation in advanced disease. US residents in radiation oncology (RO) are increasingly seeking opportunities to become involved in GH during and beyond residency, and program directors wish to support this interest.^{8,9}

However, across a backdrop of altruistic energy, there has been little guidance on *how* to implement new GH initiatives. Radiation oncologist trainees lack an organized network of GH faculty mentors, whereas program directors lack a blueprint for how to foster an interest in GH during residency.^{8,9} As with all

ASSOCIATED CONTENT

Appendix

Author affiliations and support information (if applicable) appear at the end of this article.

Accepted on November 10, 2020 and published at ascopubs.org/journal/go on February 11, 2021: DOI <https://doi.org/10.1200/GO.20.00315>

beginnings, there currently is a lack of relevant experience among radiation oncologists, lack of well-established pathways, and lack of cancer-specific GH faculty, even at centers where GH institutes have been established. To share information about existing GH programs and to help provide guidance to new programs, we performed a qualitative investigation of RO residency programs in the United States. Through this, we hope to empower further efforts that allow high-income country and low- and middle-income country (LMIC) collaboration to improve cancer care for patients in a time of great need.

METHODS

US RO residency programs with established GH initiatives were identified through the Association of Residents in Radiation Oncology (ARRO) and the 2018 ARRO Global Health Resident Survey.⁹ Programs had to meet the following criteria for inclusion: (1) active resident involvement in RO-specific GH opportunities, (2) active faculty involvement in these initiatives, (3) department chair or program director awareness and support for ongoing opportunities, and (4) focus on LMIC. Among 88 residency programs, 11 were identified and invited for an in-depth 1- to 1.5-hour interview via teleconference. Institutional review board review for ethical approval was not required.

A semi-structured interview was conducted to learn frameworks of their RO GH programming, including the type of initiative, planning, staff and resident involvement, challenges, components to success, and history of the programs through December 2018. Correspondents included program directors or a point of contact identified by the program director who had direct involvement with their GH initiative. A set of standardized questions (Appendix, online only) was used to guide the conversation, and, if needed, follow-up e-mails were sent to clarify any missing points and ensure all standard questions were covered. Notes from interviews were saved with appended e-mail responses and analyzed as a group.

RESULTS

All 11 identified US RO residency programs with GH initiatives are listed in [Table 1](#). Based on qualitative interviews, there were nine common themes for initiatives that appeared (1) clinical development and equipment, (2) clinical mentorship, (3) education, (4) remote tumor board, (5) promotion of local research, (6) industry partnership, (7) clinical care, (8) innovative technology, and (9) bilateral international hosting programs. Programs had sites with GH initiatives in Africa, Latin America, and Asia. A map of connections is shown in [Figure 1](#).

GH initiatives began in 2010, 2011, 2012, 2015 ($n = 2$), 2017 ($n = 4$), and 2018 ($n = 2$). The number of total resident participants per program ranged from one to 13 (median = 3) over each program's history. Program initiatives spanned the following categories: education ($n = 9$ [82%]), clinical mentorship (73%), innovative technology

(55%), bilateral hosting programs (45%), clinical development and equipment (45%), promotion of local research (36%), clinical care (36%), industry partnerships (27%), and remote tumor board (18%). Examples of different initiatives are displayed in [Table 2](#).

Faculty mentors for resident GH initiatives included radiation oncologists in 10 programs (91%), medical physicists in six (55%), and non-RO department faculty (eg, medical oncology, gynecology-oncology, and so on) in three (27%). Only six programs (55%) had faculty with prior GH experience. Four (36%) programs reported medical student involvement in projects. Four (36%) programs were built upon existing institutional connections, four (36%) started with resident or medical student travel to the site (either during the planning process or after the return of the trainee), one (9%) spurred from an existing staff family connection, one (9%) arose from being contacted by the LMIC center, and one (9%) was planned from the beginning with RO department leadership.

A summary of the logistics for GH experiences during residency is shown in [Table 3](#). Most programs (73%) required resident time preparation, half of the residents (45%) participated in their final 2 years of residency, and most (82%) were able to obtain 50%-100% funding from their RO department for their projects, including travel. Of six cases where outside funding was required, four (67%) obtained support from their university's GH institute, one (17%) from a clinical innovation grant, and one (17%) from the ARRO Global Health Scholars Program.¹⁰

The current GH program was the same as originally planned for five programs (45%), somewhat similar for four (36%), and not the same for two (18%). Nearly all (91%) programs indicated that their initiatives have grown. All (100%) stated that there is perceived benefit at both home and international institutions and foresee growth. Seven (64%) focused on the same location(s) since inception, whereas four (36%) stated they expanded their GH efforts to involve new locations over time.

Barriers impeding initiatives included international communication (36%), time for faculty (18%), funding (9%), and legal (9%) concerns. Three (27%) programs adjusted their project scope based on legal limitations. Institutional permission, time for residents, and safety were not reported as barriers by any program. These results are summarized in [Figure 2](#).

Each program described the most important factor for success in their GH effort for other programs to learn from. Responses were analyzed and fit into one or more of these common categories: (1) developing lasting relationships (with global partner), (2) identifying partner institution's needs, (3) funding for residents, (4) time for residents, (5) achievable metrics and sustainability, (6) faculty for long-term involvement, and (7) department leadership support. Developing lasting relationships and identifying

TABLE 1. US Residency Program Global Health Initiatives

Start Date	Program	Initiative	Site	Residents	Medical Students Involved	How It Started
2010	UCSD	a, g, h	Many (including Argentina, Costa Rica, England, Mexico, Senegal, Thailand, Vienna, and Vietnam)	2-3 per year	No	Program planning by RO department leadership
2011	Harvard	a, b, c, d, e, f, g, h, i	Botswana: University of Botswana; Botswana Harvard AIDS Institute	5 total	Yes	Built upon existing institutional connection
2011	UPenn	a, b, c, e, g, h, i	Botswana: Princess Marina Hospital; University of Botswana	13 total (6 non-Penn)	Yes	Built upon existing institutional connection
2012	UCLA	a, b, c, e, g, i	Brazil: Los Barretos Hospital de Amor	2 total	No	Resident travel to center (after return)
2015	MD Anderson	b, c, d, h	Zambia: Cancer Diseases Hospital	6 total	No	Contacted by LMIC center
2017	Duke	a, b	Tanzania: Bugando Medical Center	1 total	No	Resident travel to center (while planning)
2017	Stanford	b, c, h	Kenya: Kenyatta National Hospital Tanzania; Ocean Road Cancer Institute	1 total	Yes	Resident travel to center (after return)
2017	UCSF	c, e, i	Tanzania: Ocean Road Cancer Institute	4 total	No	Built upon existing institutional connection
2017	MCW	b, c, i	India: Christian Medical College	1 total	No	Built upon staff family connection
2018	Emory	c, f	Ethiopia: Black Lion Hospital	1 total	No	Built upon existing institutional connection
2018	Vanderbilt	b, c, f, h	Many (including Colombia, Guatemala, and Peru)	1 total	Yes	Medical student travel to center (after return)

Abbreviations: a, clinical development and equipment; b, clinical mentorship; c, education; d, remote tumor board; e, promotion of local research; f, industry partnership; g, clinical care; h, innovative technology; i, bilateral international hosting program; LMIC, low- and middle-income country; MCW, Medical College of Wisconsin; RO, radiation oncology; UCLA, University of California Los Angeles; UCSD, University of California San Diego; UCSF, University of California San Francisco; UPenn, University of Pennsylvania.

partner needs were the most recognized factors for success, as shown in [Figure 3](#).

DISCUSSION

GH programs appear to be increasing over time with over half of new programs emerging in the last 2 years. Initiatives spanned many categories, with the majority of programs incorporating education and clinical mentorship in their activities. About half of programs involved innovative technology, bilateral hosting programs, and clinical development and equipment. Less frequently, programs included the promotion of local research, involvement in clinical care, industry partnerships, and remote tumor board. As initiatives grew with their first resident involved, over time there was a trend toward more resident involvement and greater scope of activities. The collective experiences establish an early framework in RO for approaching GH at the program level.

How are GH partners identified? The most common geographic region for initiatives was in Africa, with 8 of 11 programs focusing efforts there. Among other regions in the world, two programs had a focus in Latin America, one in India, and one in Southeast Asia. In general, the following strategies exist to create GH opportunities for residents: establish a new

relationship with a single RO department, build upon an existing institutional partnership (may be multidisciplinary), or create pathways with multiple institutions to fit resident interests. The following examples illustrate each approach:

Establish a new relationship with a single RO department. University of California Los Angeles/Los Barretos Hospital de Amor.

A University of California Los Angeles (UCLA) RO resident befriended a Brazilian physician at the American Society for Radiation Oncology (ASTRO) national conference. He later applied for the ARRO GH travel award, traveled to Brazil for one month during residency, and through his visit started a twinning relationship between UCLA and the second largest cancer hospital in Brazil. UCLA now hosts an annual conference each year with its partner site in Brazil. This started with multiple faculty in RO and now includes several other UCLA departments for multidisciplinary cancer collaboration.¹¹

Medical College of Wisconsin/Christian Medical College.

Beginning with a familial tie between a radiation oncologist at Medical College of Wisconsin (MCW) and a hospital in India, the two institutions began talking about collaboration in 2013. This was formalized in 2017. The program is evolving and has grown into a partnership involving many

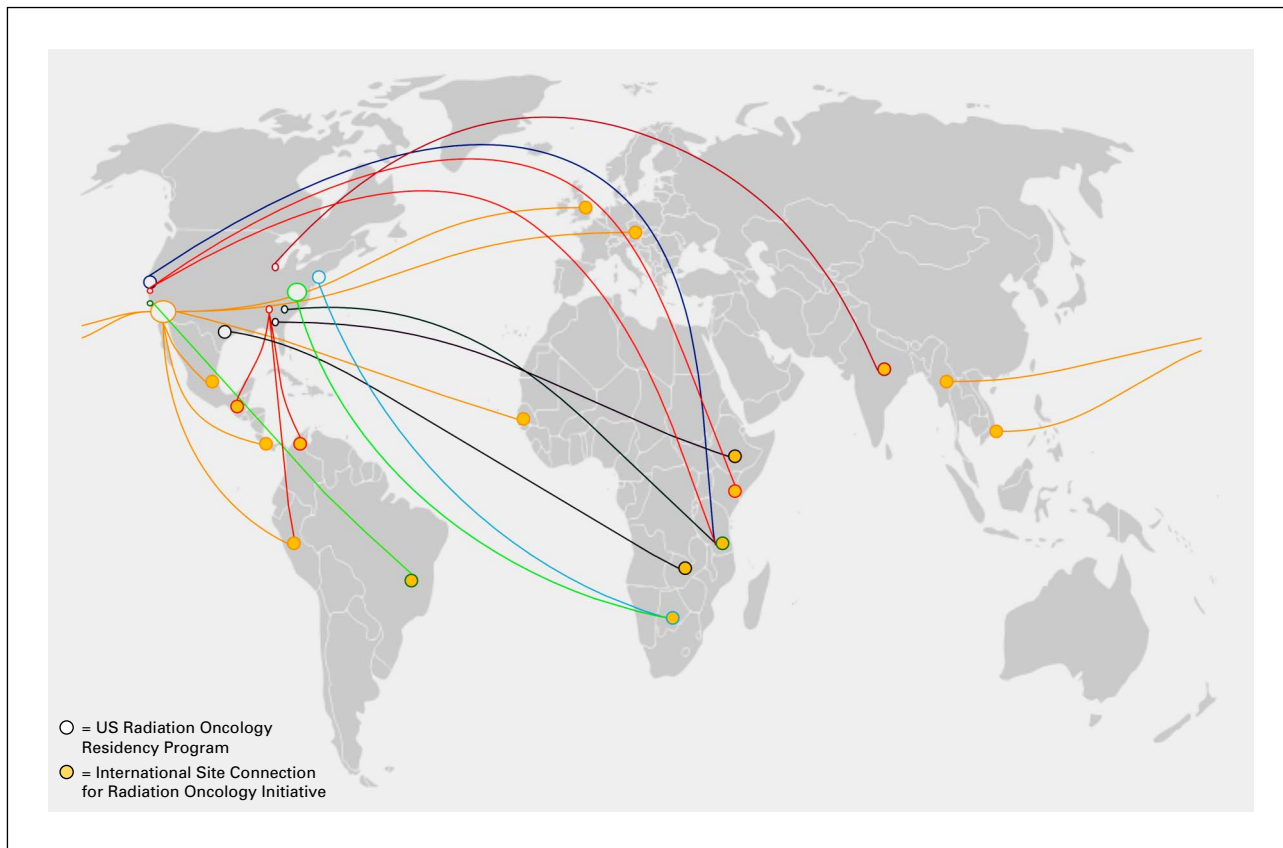


FIG 1. World map of US radiation oncology residency program–based initiatives from 2010 to 2018.

departments (RO, medical oncology, gynecologic oncology, and so on). It permits an exchange of clinicians from India to MCW and vice versa, and there is a longitudinal relationship including residents through Zoom conference calls in Grand Rounds fashion.

MD Anderson Center/Cancer Center/Cancer Diseases Hospital.

The department was contacted directly by a resident-teaching hospital in Zambia seeking support. This conversation led to the development of an institutional twinning relationship that has focused on education initiatives involving residents, using remote engagements to learn about realities and challenges of radiotherapy in the region and then using that to inform educational projects in conjunction with supportive faculty. An example is a 1-week radiobiology course designed by a resident for LMIC settings that can be replicated and shared with other centers.

Others that began with new single-department partnerships include Duke/Bugando Medical Center and Stanford/Kenyatta National Hospital and Ocean Road Cancer Institute.

Build upon an existing institutional partnership. Harvard University/University of Botswana, Botswana Harvard AIDS Institute. The partnership developed out of an existing relationship in Botswana based on HIV-AIDS work, with an idea to expand to RO. Harvard established a weekly multidisciplinary tumor board through its Botswana

Oncology Global Outreach initiative beginning in 2012, which helped identify challenges and has been the gateway for many other collaborations and bidirectional exchange trips. It now involves numerous staff from RO as well as other departments and has established extramural funding pathways.¹²

University of Pennsylvania/Princess Marina Hospital, University of Botswana. UPenn had a very well-established partnership with a university hospital in Botswana and sent medical students and residents in many different specialties.¹³ With full institutional support, UPenn established a full-time–supported RO faculty living and working internationally for GH work since 2014. With this strong connection, there is now a direct link for research, education, and advancement of clinic care that extends regionally from the partner site. For RO rotations, 13 residents, including 6 from outside UPenn, have rotated at this host site.

Emory University/Black Lion Hospital. The RO department at Emory University was interested in starting a GH initiative, and its Center for Global Health identified an existing memorandum of agreement with a hospital in Ethiopia. After speaking with the hospital and learning its needs, an Emory resident worked with the faculty to develop an off-line head- and neck-contouring module. This helped

TABLE 2. Examples of Different Types of GH Initiatives

Code	Initiative Type	Examples	How Resident Is Involved	How Faculty Is Involved
a	Clinical development and equipment	Visiting an RO center in the phases of installing a new teletherapy unit, to provide onsite clinical guidance and support.	Planning trip, communicating with center and relevant stakeholders	Assisting with planning, helping to create pathway in residency program
b	Clinical mentorship	Recurring teleconferences to continue sharing experiences, guidance, and resources. Learning about challenges and designing solutions.	Involved in teleconferences, may help share resources or design solutions.	Involved in mentorship sessions, garnering department support and buy-in and supporting new projects
c	Education	Teaching contouring, 3D anatomy, radiobiology, and other topics. Developing an off-line module for learning head and neck contouring that can be repeated for future use.	Involved in developing educational curriculum. Helping with some teaching.	Helping with guidance for development of curriculum. Helping with teaching.
d	Remote tumor board	Recurring multidisciplinary remote tumor board, monthly with guest faculty and different topics each month. Eventually established CME credit.	Residents are invited to join and gain exposure to interesting cases and learn about challenging scenarios.	Faculty are invited to join and take turns leading case discussions.
e	Promotion of local research	Helping clinic members to improve research and English-writing skills. Helping to brainstorm project ideas and support local research efforts.	Involved in research projects, writing, or critical review of manuscripts.	Involved in research projects, writing, or critical review of manuscripts. Serving as a resource for residents.
f	Industry partnership	Donated software license for use in GH project. Support with international contacts and introductions.	Conversations with industry to explore partnership opportunities.	Conversations with industry to explore partnership opportunities and official departmental support.
g	Clinical care	Visiting an RO center and gaining firsthand experience with clinical care either directly or indirectly, depending on what each institution allows.	Visiting clinic onsite and participating in clinical care, including consult visits, contouring, and/or brachytherapy procedures.	May help facilitate setting up the experience, approving external rotation.
h	Innovative technology	Introducing new cloud-based software that allows for sharing and review of treatment plans for education and research projects. Piloting auto-contouring or auto-planning tools. Mobile applications that can help with diagnostics or patient navigation are suited for limited-resource settings.	Discovering existing innovative technology solutions that can be applied, innovative technology developed in-house. Helping with its smooth implementation and troubleshooting.	Could be early adopters or developers of innovative technology. Supporting the residents in their efforts.
i	Bilateral international hosting program	Multiple staff visiting US center for a month to shadow patients and practice contours, although all clinical work is still handled by the attending and resident.	Interacting and working with visiting staff.	Interacting and working with visiting staff.

Abbreviations: CME, continuing medical education; GH, global health; RO, radiation oncology.

Ethiopian RO residents achieve significant improvements in their abilities.¹⁴ The program was so successful that it has now been implemented at Emory’s own residency program for training new residents.

Others that have built upon existing institutional partnerships include University of California San Francisco (UCSF)/Ocean Road Cancer Institute. (An advantage of multidisciplinary partnership with one center is a better 360° understanding of the health system, barriers, and opportunities. By concentrating efforts from multiple departments into one center, efforts can learn from each other and be streamlined for a wholistic approach within the center.

Open pathways with multiple institutions. University of California San Diego. The department established an international rotation program for medical and physics residents, who are offered the chance to travel for 1 month during their residency to an international site of their choice. This includes both high-income countries and LMIC globally. Department leadership perceives several benefits of this program, and most residents participate in this opportunity during their residency.¹⁵

Vanderbilt University. A Vanderbilt medical student first traveled and established relationships with several clinics in Latin America, then introduced the concept of remote engagements in real time with multiple institutions sharing

TABLE 3. Logistical Experiences With Global Health Initiatives for Residency Programs

Institutional Experience	Yes	No
Resident time preparation required	8 (73%)	3 (27%)
Timing		
PGY-4 or PGY-5	5 (45%)	—
PGY-3	1 (9%)	—
No restriction	5 (45%)	—
RO department funding support		
100%	5 (45%)	—
50%-99%	4 (36%)	—
< 50%	2 (18%)	—
Current program same as the original plan	5 (45%)	2 (18%)
Somewhat the same	4 (36%)	
Has grown over time	10 (91%)	1 (9%)
New locations over time	4 (36%)	7 (64%)
New faculty involved over time	8 (73%)	3 (27%)
Foresee more growth	11 (100%)	0 (0%)
Perceived bilateral benefit	11 (100%)	0 (0%)

Abbreviations: PGY, post-graduate year; RO, radiation oncology.

similar educational needs. Now connections exist for other medical students, residents, and faculty to connect with these clinics simultaneously.^{16,17} A telehealth curriculum is delivered as a series of video conferences with volunteer support from faculty educators at Vanderbilt and other institutions. The pool of educators is organized by Rays Contra Cancer (RCC),¹⁸ a nonprofit organization that designs outreach opportunities in RO for practitioners in limited-resource settings. Vanderbilt Medical School remains an RCC hub for medical students to build programs with faculty mentorship.

What do faculty roles look like? The engagement of faculty was important for each program's success. Primary faculty, including radiation oncologists, medical physicists, or other specialists, were able to facilitate continuity and the entryway for residents in projects catered to their level of

experience. Previous GH experience was not necessary as nearly half of departments stated no prior GH experience among faculty. Multiple approaches were identified to engender faculty involvement. Several residents have presented their GH experience to the entire department, which subsequently led to faculty interest. Some faculty have participated in remote educational engagements with partner centers. Some departments, such as UCSF, have hosted monthly global oncology seminars that have been attended by residents, fellows, faculty, and outside speakers. Lastly, UPenn supports a full-time GH RO faculty. Strong support from department leadership was among the most important factors mentioned for programs with GH.

Can outside organizations help new programs? In some cases, RO may serve as the link between institutions for further collaboration in neighboring disciplines, collaboration with industry, or partnership with supportive for-profit organizations and non-profit organizations (NGOs). With many institutions and organizations currently interested to support new initiatives, the landscape for GH in RO is ripe for synergy. Institutions can partner by supporting new initiatives or by expanding upon existing work.

NGOs can identify needs and contact academic institutions for possible support. This was the case for an RO program in Kenya, in which RAD-AID NGO identified a need for help with radiotherapy development and contacted Stanford, subsequently catalyzing the start of an initiative involving mentorship and education. Industry can also lend support for new initiatives, as Vanderbilt received assistance with establishing contacts in Latin America for its initiative, and Emory received support for the design and implementation of an educational module to aid with head-and-neck contouring accuracy. Additionally, the International Atomic Energy Agency (IAEA) funds residents for 2-3 months to work with them on projects in underserved regions, and MD Anderson has had two residents successfully get IAEA internships in Africa.

What barriers should be anticipated, and what successes can we learn from? Programs shared their greatest barriers and components for success. Surprisingly, most programs did not report funding, resident and/or faculty time, safety, and legal concerns as barriers to implementation. This could be related to selection bias, wherein only successful programs were interviewed who had adequate funding and support of resident and/or faculty time or whose initiatives lacked intensive financial or time requirements. Residents who traveled felt safe visiting foreign collaborating centers, and project proposals were generally received with enthusiastic support and flexibility from foreign partners. Communication was the most common barrier identified, reported by 4 of 11 programs.

The ability to communicate reliably is an important consideration in GH work. Today, improved internet connectivity allows smooth texting, e-mail, and phone and video

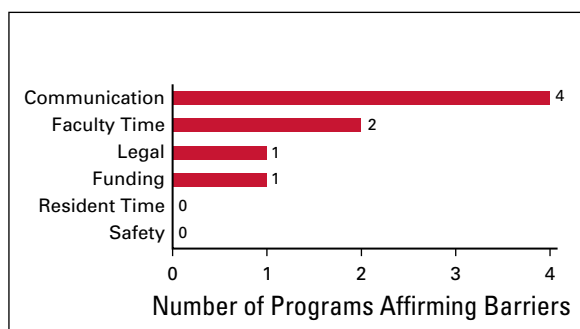
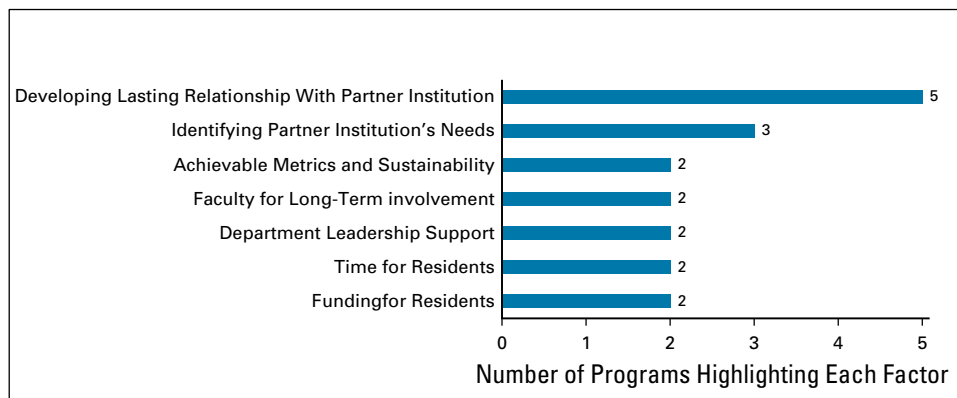
**FIG 2.** Barriers in implementing global health initiatives for residency programs.

FIG 3. Most important factors for implementing global health initiatives for residency programs.



calls. For live interactions, time zone differences must be taken into account and clearly communicated, especially during daylight savings time transitions. Avenues of communication and collaboration will likely improve further as technologies evolve for remote peer review, quality assurance, treatment planning, and other virtual supportive environments.

Another dimension of communication is language. This could be one reason that less US collaboration has been observed in Latin America, Asia, Oceania, and the Middle East. An ASTRO survey demonstrates increasing diversity in the US RO workforce of up to 30.2% non-White members,¹⁹ although a gap still exists between our field and others in medicine.²⁰ Residents, faculty, medical students, and other supporters fluent and experienced in other languages and regions can be valuable to GH programs. Same-language interactions create a cultural connection that may strengthen working relationships and help new initiatives succeed.^{21,22}

Overall, developing lasting relationships and identifying partner institution needs were most recommended for success. One program advised, “Ideas for the best collaborations will come naturally through engagement, discussion, curiosity, and open exploration. . . listen to what the actual problems are, and then build solutions based on real

problems.” Another program stated, “If you want to get something off the ground, ask what they want, not what you think they need.” Both require humanistic communication and interaction, not just for logistics but also for friendship and connection.

This analysis is limited by depending on self-reporting. There is a risk of bias and no verification system for the reports from each institution. Additionally, future work exists to explore residency programs that tried but failed to establish a GH program by our predefined criteria. This would provide additional insight into barriers that have limited residency programs as there exist instances of single resident or faculty involvement that do not lead to the development of a departmental GH program.

In conclusion, in response to the rising cancer needs globally and interest in GH RO, there are a number of successful ways to establish program initiatives. Once established, the most important factors to facilitate a continued and enriching residency GH program are longitudinal involvement by at least one faculty member and high-quality communication with global partners. A program will be most successful if clinics of all resource levels feel heard, respected, appreciated, and seen as partner collaborators. In the end, we are all working together to help patients with cancer who come to us seeking care.

AFFILIATIONS

¹Department of Radiation Oncology, University of California San Francisco, San Francisco, CA

²Rayos Contra Cancer, Nashville, TN

³Department of Radiation Oncology, University of Tennessee Health Science Center, Memphis, TN

⁴Harvard University T.H. Chan School of Public Health, Boston, MA

⁵Department of Radiation Oncology, University of North Carolina, Chapel Hill, NC

⁶Department of Radiation Oncology, MD Anderson Cancer Center, Houston, TX

CORRESPONDING AUTHOR

Benjamin C. Li, MD, MBA, Department of Radiation Oncology, University of California San Francisco, San Francisco, CA 94117; Twitter: @BenLiMD; e-mail: bli@post.harvard.edu.

PRIOR PRESENTATION

Presented as a poster at the ASTRO 2019 Annual Conference, September 15-18, Chicago, IL.

AUTHOR CONTRIBUTIONS

Conception and design: Benjamin C. Li, Daniel V. Wakefield, Anuja Jhingran

Collection and assembly of data: All authors

Data analysis and interpretation: All authors

Manuscript writing: All authors

Final approval of manuscript: All authors

Accountable for all aspects of the work: All authors

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The following represents disclosure information provided by authors of this manuscript. All relationships are considered compensated unless otherwise noted. Relationships are self-held unless noted. I = Immediate Family Member, Inst = My Institution. Relationships may not relate to the subject matter of this manuscript. For more information about ASCO's conflict of interest policy, please refer to www.asco.org/rwc or ascopubs.org/go/authors/author-center.

Open Payments is a public database containing information reported by companies about payments made to US-licensed physicians ([Open Payments](http://www.openpayments.gov)).

No potential conflicts of interest were reported.

ACKNOWLEDGMENT

The authors of this study would like to acknowledge the participation of each academic center in this study for volunteering their time and for their dedication to promoting the new field of global health in radiation oncology.

REFERENCES

1. Khan OA, Guerrant R, Sanders J, et al: Global health education in U.S. medical schools. *BMC Med Educ* 13:3, 2013
2. AAMC: Medical School Graduation Questionnaire: 2019 All Schools Summary Report, Washington D.C. 2019
3. Drain PK, Holmes KK, Skeff KM, et al: Global health training and international clinical rotations during residency: Current status, needs, and opportunities. *Acad Med* 84:320-325, 2009
4. Gupta AR, Wells CK, Horwitz RI, et al: The International Health Program: The fifteen-year experience with Yale University's Internal Medicine Residency Program. *Am J Trop Med Hyg* 61:1019-1023, 1999
5. Haq C, Rothenberg D, Gjerde C, et al: New world views: Preparing physicians in training for global health work. *Fam Med* 32:566-572, 2000
6. Peluso MJ, DeLuca MA, Dagna L, et al: Socially accountable global health education amidst political uncertainty and reactionary nationalism: A value proposition and recommendations for action. *Ann Glob Health* 85:118, 2019
7. Bray F, Ferlay J, Soerjomataram I, et al: Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 68:394-424, 2018
8. Elmore SNC, Royce TJ, Freese C, et al: Views on global health among radiation oncology residency program directors: A knowledge, attitudes, and practices survey. *Int J Radiat Oncol Biol Phys* 102:e388-e389, 2018
9. Wakefield DV, Lee A, Li B, et al: Resident engagement in global Health: Results of the first decade (2009-2019) of the Association of Residents in Radiation Oncology (ARRO) global health initiative. *Int J Radiat Oncol Biol Phys* 105:E158-E159, 2019
10. Dad L, Shah MM, Mutter R, et al: Why target the globe?: 4-year report (2009-2013) of the Association of Residents in Radiation Oncology Global Health Initiative. *Int J Radiat Oncol* 89:485-491, 2014
11. Hospital de Amor: Barretos—UCLA radiation oncology refresher course 2019 and ASTRO endorsed meeting. <http://oncoeventos.com.br/evento/87-barretos—ucla-radiation-oncology-refresher-course-2019-and-astro-endorsed-meeting>
12. BOTSOGO: Botswana Oncology Global Outreach: <http://www.botsogo.org/>
13. Home!Botswana-UPenn Partnership|Perelman School of Medicine at the University of Pennsylvania. <https://www.med.upenn.edu/botswana/>
14. Abugideiri M, Schreiber E, Switchenko J, et al: A prospective international pilot study evaluating the efficacy of a self-guided contouring teaching module with integrated feedback for transitioning from 2D to 3D treatment planning. *Int J Radiat Oncol Biol Phys* 103:E6, 2019
15. Brown DW, Einck J, Pawlicki T, et al: The case for elective international residency rotations. *Int J Radiat Oncol Biol Phys* 93:963-964, 2015
16. Li B: Vanderbilt medical student establishes Rayos Contra Cancer Project. Vanderbilt Center for Latin American Studies. Newsletter, 2018, 43:5-6
17. Hatcher J, Shulman A, Dempsey C, et al: Collaborative model for International Telehealth: High dose rate brachytherapy training for emerging radiation oncology centers in lower- and middle-income countries. *JCO Glob Oncol* 6:51-52, 2020
18. Rayos Contra Cancer—Global radiotherapy. <https://www.rayoscontracancer.org/>
19. Fung CY, Chen E, Vapiwala N, et al: The American Society for Radiation Oncology 2017 radiation oncologist workforce study. *Int J Radiat Oncol Biol Phys* 103:547-556, 2019
20. Lightfoote JB, Fielding JR, Deville C, et al: Improving diversity, inclusion, and representation in radiology and radiation oncology part 1: Why these matter. *J Am Coll Radiol* 11:673-680, 2014
21. Larkan F, Uduma O, Lawal SA, et al: Developing a framework for successful research partnerships in global health. *Glob Health* 12:17, 2016
22. John CC, Ayodo G, Musoke P: Successful global health research partnerships: What makes them work? *Am J Trop Med Hyg* 94:5-7, 2016



APPENDIX

1. What is the program-specific initiative? How long has it been?
2. What planning went into it?
 - Time/timeline.
 - How and why did you choose the site you did?
 - Previous onsite visit? How many?
 - Faculty with prior global health experience?
 - Medical student involvement?
 - Money (department v grant application and funding)?
3. How many faculty are involved? What are their roles?
4. Were any challenges encountered in establishing the initiative?
 - Communication/coordination:
 - Legal issues:
 - Institutional permission:
 - Partner site(s) permission:
 - Funding:
 - Time for faculty:
 - Time for residents:
 - Safety concerns:
5. Did your initiative turn out as initially planned? If not, why?
6. Has your initiative evolved over time? If so, how?
7. What are the most important factors for another program to consider when choosing to start a global health initiative? Any useful resources or suggestions?
8. What are the perceived benefits of your initiative? (eg, unilateral v bilateral)