A Study of Global Health Elective Outcomes: A Pediatric Residency Experience

Global Pediatric Health
Volume 4: 1–12

DOI: 10.1177/2333794X16683806
journals.sagepub.com/home/gph
SAGE

A Study of Global Health Elective Outcomes: A Pediatric Residency Experience

Christiana M. Russ, MD, DTMH[1,2], Tony Tran, BS[1], Melanie Silverman, MPH[1], and Judith Palfrey, MD[1,2]

Abstract

Background and Objectives: To identify the effects of global health electives over a decade in a pediatric residency program. **Methods:** This was an anonymous email survey of the Boston Combined Residency alumni funded for global health electives from 2002 to 2011. A test for trend in binomial proportions and logistic regression were used to document associations between elective and participant characteristics and the effects of the electives. Qualitative data were also analyzed. **Results:** Of the 104 alumni with available email addresses, 69 (66%) responded, describing 94 electives. Elective products included 27 curricula developed, 11 conference presentations, and 7 academic publications. Thirty-two (46%) alumni continued global health work. Previous experience, previous travel to the site, number of global electives, and cumulative global elective time were associated with postresidency work in global health or with the underserved. **Conclusions:** Resident global electives resulted in significant scholarship and teaching and contributed to long-term career trajectories.

Keywords

global health, graduate medical education, career choice, international education exchange, pediatrics

Received October 14, 2016. Accepted for publication October 19, 2016.

Introduction

Global health (GH) electives are increasingly being offered during residency. Studies have demonstrated that such electives improve physical exam skills and increase knowledge of tropical medicine.[1-8] Recent qualitative research analyzing reflective essays by pediatric GH track residents demonstrated that their learning mapped to the Accreditation Council for Graduate Medical Education (ACGME) competencies.[5]

Despite these positive findings, medical educators have questioned GH electives' value and impact,[9-14] and they have called for improvements in GH education.[2,3,15] Concerns are raised about lack of trainee preparation, consistency across training sites, and that GH electives may place undue burden on resource-strapped host institutions.[9,14,16,17] Recent articles note resident stress during GH electives, and impact of culture shock and reentry.[18,19] And little is known about longer term outcomes of GH electives. Some studies show participants are more likely to work with underserved communities, but there are minimal data about ongoing careers in GH.[6,20,21]

Currently, 58% of pediatric training programs offer international field experiences and 25% offer a formal GH track.[22-25] The Boston Combined Residency Program has accessed multiple funding sources to which residents may apply for travel support. We report on a decade's experience with GH electives.

Methods

In this mixed quantitative and qualitative retrospective study, we explored products (projects and skills developed), outcomes (effect on knowledge and attitudes), and career impact of pediatric residency GH electives. Our objectives were to:

[1]Boston Children's Hospital, Boston, MA, USA
[2]Harvard Medical School, Boston, MA, USA

Corresponding Author:
Christiana M. Russ, Boston Children's Hospital, 300 Longwood Ave, 11S Main, Boston, MA 02115, USA.
Email: Christiana.russ@childrens.harvard.edu

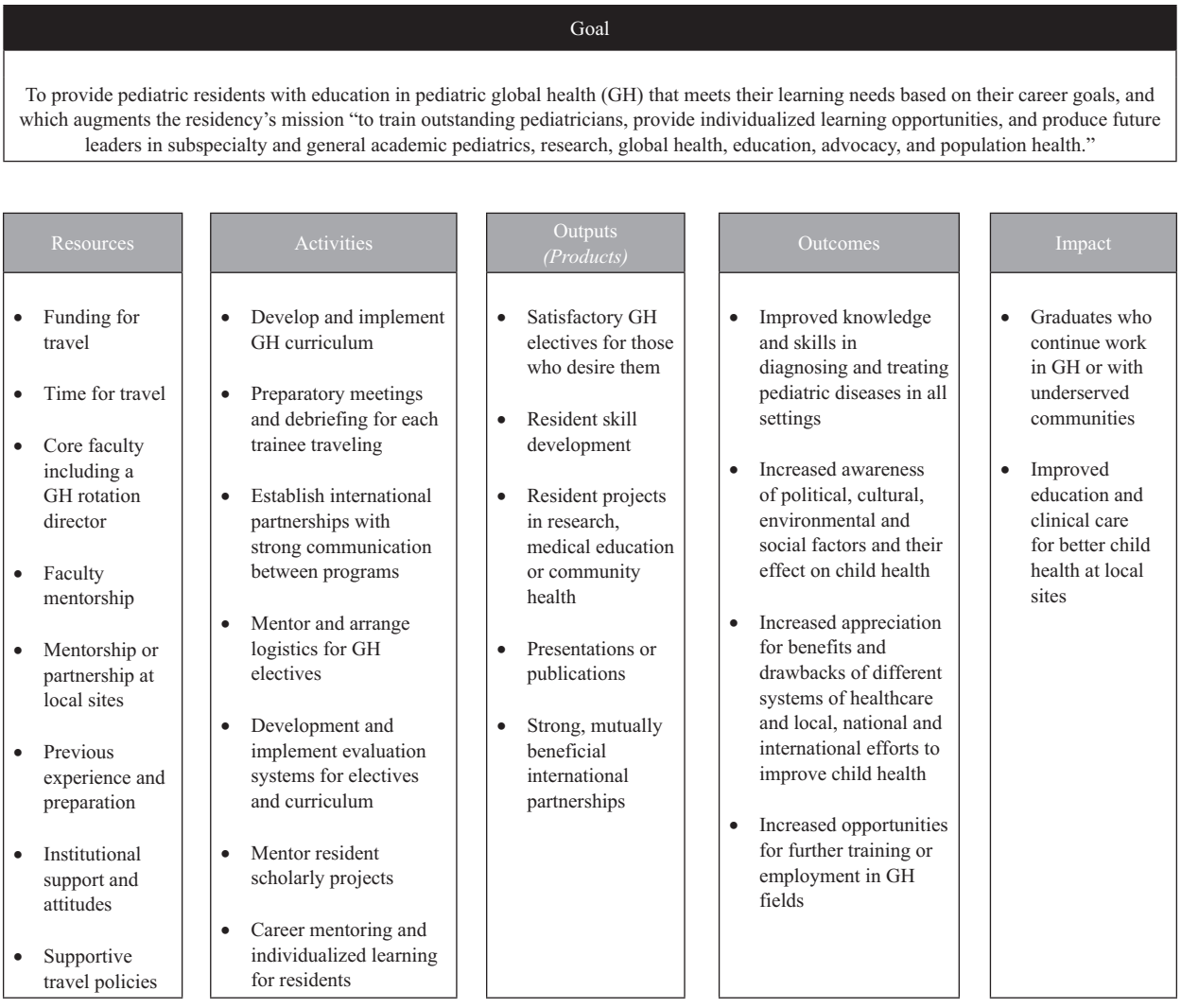

Figure 1. Logic model for global health education in residency.

1. Document GH elective *products* (projects or research completed and skill development)
2. Explore how *participant factors* relate to those products and outcomes, including participants' knowledge, skills, awareness, and careers
3. Assess how *characteristics of the elective experience* affect elective products and careers

To facilitate our evaluation, we developed the logic model presented in Figure 1.[26]

Based on the logic model, we developed the study survey (see the appendix) to ask about participant and elective characteristics, elective products, self-perceived impact on knowledge and attitudes, along with magnitude of career impact. When possible, questions were modeled after similar studies.[27] Open field text questions asked how careers were affected, and descriptions of current work in GH or with the underserved. We refined the survey with input from members of the executive committee of the Association of Pediatric Program Directors Global Health Pediatric Education Group. In additions, 3 Boston Combined Residency faculty members who had done GH electives at other residencies piloted the survey and provided cognitive interviews and retrospective verbal probing.

All Boston Combined Residency alumni who received funding for a GH elective between 2002 and 2011 were eligible to participate. Using departmental databases, we identified 132 former residents who had used award funds for global travel, excluding the primary author. In March 2014, we emailed the 104 alumni for whom we had accurate email addresses, inviting them to participate in the online REDCap survey.[28] We sent 3 consecutive weekly requests to nonrespondents; we closed enrollment after 6 weeks.

For the quantitative sections of the survey, we used Stata Statistical Software (Release 13; StataCorp LP, College Station, TX) to assess associations between mitigating factors and means of the Likert-type responses for primary outcomes. We conducted χ^2 and Fisher's exact tests for categorical responses and *t* test for numerical responses. Alpha was set at .05 for all tests. We performed bivariate and multivariate logistic regressions to understand the relative impact of participant factors on outcomes.

For qualitative questions, results were analyzed using principles of open coding and thematic analysis to identify patterns in responses, facilitated by NVIVO software (Version 10; QSR International Pty Ltd, Doncaster, Victoria, Australia). Multiple coding and cross-checking optimized interrater reliability among the 2 coders who separately coded the interviews and met to compare and resolve any differences, and reconstructed and compared relationships among themes.

This study was approved by the Boston Children's Hospital Institutional Review Board.

Results

We received complete responses from 69 individuals, representing 66% of those emailed and 52% of trainees funded for GH electives. Respondents described 94 GH electives undertaken from 2002 to 2011 in 28 countries.

Objective 1: Global Health Elective Products

The majority (40, 58%) of respondents reported their primary goal was to gain GH clinical experience, with the remainder working on community health projects (14, 20%), research projects (5, 7%), medical education projects (2, 3%), or other (8, 12%).

Table 1 shows elective products grouped as personal/professional skill development, educational projects, or scholarly products. A majority of participants reported improvement in clinical exam skills (48, 70%), with significant increases in mean number of personal skills developed for those who did multiple electives (0.93 outputs vs 2.96, $P < .001$). Fourteen residents (20%) reported scholarly products, with 11 (16%) presenting at national conferences and 7 (10%) publishing academic articles based on their GH elective work.

Objective 2: Participant Factors

Forty-six residents (67%) had previous international field experience, with 13 (20%) reporting a year or more (Table 2). Nearly half of the residents with experience (21, 47%) did more than one GH elective compared with only 4 (20%) with no prior experience ($P = .04$). Fifty-four percent (25) of the experienced residents had onsite mentorship versus 5 (25%) without previous experience ($P = .03$).

Previous experience, number of GH electives, previous travel to the site, and cumulative elective time were not significantly associated with completing scholarly products, but were all strongly associated with postresidency work in GH or with the underserved. When controlling for previous experience, continuing a career in GH or with the underserved remained associated with spending more than 5 cumulative weeks on GH elective (adjusted odds ratio [AOR] = 9.4, 95% confidence interval [CI] = 1.6-55.2). When controlling for cumulative elective time, continuing a career in GH or with the underserved remained associated with greater previous experience: (0.5-5 months - AOR 7.3 (95% CI 1.7-31.2), >6 months – AOR 31.1 (95% CI 5.0-192.1).

Objective 3: Global Health Elective Factors

Residents were asked to describe their perceived impact of each GH elective *as applied in their current work domestically or internationally*. A majority of respondents rated each elective's impact on their clinical knowledge and skill as mild (38, 40%) to moderate (38, 40%). Most reported a moderate (47, 51%) to large (29, 32%) impact on their awareness of social determinants of health, and almost all reported a moderate (46, 49%) to large (39, 42%) impact on their awareness of health systems.

Twenty-eight (30%) residents spent 2 weeks or less on elective, and only 11 (12%) residents spent longer than 4 weeks. Longer electives had a significantly greater self-perceived impact than those of shorter duration on clinical knowledge and on awareness of social factors' effects on child health. Thirty-six percent of those who spent longer than 4 weeks on rotation indicated having a large impact on clinical knowledge versus 15% of those who spent 3 to 4 weeks versus none of those who spent less than 2 weeks ($P = .01$). Fifty-five percent of those who spent longer than 4 weeks on rotation indicated having a large impact on awareness of social factors versus 32% of those who spent 3 to 4 weeks versus 22% of those who spent less than 2 weeks ($P = .04$).

Relatively few (27, 29%) resident electives were at a site with a formal partnership with the residency program. Twenty-eight (30%) reported having no mentorship, with 23 (24%) being mentored by Boston Combined Residency faculty, 32 (34%) by an on-site clinician and 11 (12%) by both. Neither formal partnership nor mentorship correlated significantly with elective products or outcomes.

Table 1. Global Health Elective Products.

Products	N = 94 Electives (%)	Examples From Qualitative Descriptions
Personal skills		
Improved clinical exam skills	70 (74%)	• Worked clinically in inpatient setting (30 electives) • Worked in outpatient clinic setting (43 electives)
Improved teaching skills	34 (36%)	• Designed curriculum • Taught medical students (12 electives)
Improved research skills	15 (16%)	• Set up a data collection system for quality improvement • Designed a research protocol, got IRB approval, developed survey and anthropometric data collection, trained field workers
Onsite education		
Formally taught locally	36 (38%)	• Taught Excel to pediatric staff • Gave 1 week of CME lectures for health care providers
Curriculum for on-site trainees	18 (19%)	• Developed a patient education module for health promoters to deliver to patients in the waiting room on common skin complaints • Trained Vietnamese clinicians in PALS and NALS
Curriculum for community education	9 (10%)	• Developed materials for teaching sexual education in brothels
Scholarly products (14 residents)		
Presented at national conference	11 (12%)	• HIV research in Malawi
Published	7 (7%)	• Assessing refugee camp services in Tanzania • Immunization uptake and attitudes toward immunization in India • Impact of foster care in Romania • Barriers to neonatal resuscitation in Kenya • Improving pediatric education in Liberia
Other		
Presented case on return	36 (38%)	
Other	12 (13%)	• Spanish language skills (4 electives) • Built an electronic medical record database for the rural health clinic

Abbreviations: IRB, institutional review board; CME, continuing medical education.PALS, pediatric advanced life support; NALS neonatal advanced life support.

Career Effect

The respondents labeled effect magnitude of the electives as career neutral (33, 35%), career affirming/opportunity expanding (48, 51%), and career-altering: transformational (13, 14%). Forty-two respondents explained the elective's effect on their career decisions with 11 already planning GH careers before the elective (Table 3). Several shifted focus within GH, often toward research. Eleven respondents reported new plans for a GH career, while 2 moved away from GH careers. Five respondents made subspecialty choices based on their experience, and 10 noted an increased focus on public health.

Twenty-eight respondents indicated the GH elective(s) enriched their competence as domestic physicians citing improved cultural competence and ability to serve immigrant patients in the United States. Others reported greater awareness of resource utilization. Four individuals wrote about negative experiences—1 remarking on an experience of poor mentorship and 2 noting feelings of being inadequately prepared for GH clinical work.

Many participants commented on changes in their personal perspectives on their roles in medicine after deep personal reflection on their GH experience.

Ongoing Global Health Work

Overall, 44 (64%) of the respondents described continued work in GH or with underserved (usually immigrant) populations after residency (Figure 2): 32 continued in GH either exclusively or combined with domestic work. Much of this ongoing work was academic with a focus on research or teaching. A minority of respondents continued in direct health care delivery with variations in

Table 2. Unadjusted and Adjusted Participant Factors in Global Health Electives During Pediatric Residency.

	Unadjusted Participant Factors in Global Health Electives During Pediatric Residency						
	Trainees (n = 69)	At Least One Curriculum Product		At Least One Scholarly Product		Continued Career in Global Health or Underserved	
	n (%)	n (%)	*P*	n (%)	*P*	n (%)	*P*
Number of GH electives							
1	42 (61)	6 (14)		6 (14)		22 (52)	
2	20 (29)	7 (35)		3 (15)		15 (75)	
3	7 (10)	5 (71)	<.001	3 (43)	.15	7 (100)	.007
Repeat rotation at 1 site							
No	60 (87)	13 (22)		10 (17)		37 (62)	
Yes	9 (13)	5 (56)	.03	2 (22)	.68	7 (78)	.35
Previous travel to site							
No	58 (84)	14 (24)		8 (14)		33 (57)	
Yes	11 (16)	4 (36)	.40	4 (36)	.07	11 (100)	.006
Previous experience							
None	23 (33)	2 (9)		2 (9)		6 (26)	
0.5-5 months	22 (32)	8 (36)		4 (18)		16 (73)	
>6 months	24 (35)	8 (33)	.06	6 (25)	.14	22 (92)	<.001
Cumulative elective time							
1-4 weeks	47 (68)	8 (17)		6 (13)		24 (51)	
≥5 weeks	22 (32)	10 (46)	.01	6 (27)	.14	20 (91)	.001
	Participant Factors Adjusted for Previous Experience and Cumulative Elective Time						
	AOR (95% CI)[a]	*P*	AOR (95% CI)[b]	*P*	AOR (95% CI)[c]	*P*	
Previous experience							
None	Ref.		Ref.		Ref.		
0.5-5 months	5.1 (0.90-28.6)	.07	2.0 (0.32-12.7)	.46	7.3 (1.7-31.2)	.007	
>6 months	4.1 (0.73-22.0)	.11	2.9 (0.50-16.9)	.24	31.1 (5.0-192.1)	<.001	
Cumulative elective time							
1-4 weeks	Ref.		Ref.		Ref.		
≥5 weeks	3.4 (1.0-10.9)	.04	2.2 (0.58-8.0)	.25	9.4 (1.6-55.2)	.01	

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; Ref., reference.
[a]Overall model significance: $P = .016$; area under the curve: 0.73; Hosmer-Lemeshow $\chi^2 = 1.17$, $P = .883$.
[b]Overall model significance: $P = .304$; area under the curve: 0.68; Hosmer-Lemeshow $\chi^2 = 7.15$, $P = .128$.
[c]Overall model significance: $P < .001$; area under the curve: 0.87; Hosmer-Lemeshow $\chi^2 = 1.47$, $P = .832$.

field time from US-based consulting to intermittent travel to full-time expatriate clinical work.

As one respondent noted, "These resident rotations were the foundations on which I've been able to build a career focusing on curriculum development, trainings and health services strengthening in Latin America."

Discussion

This study supports the educational value, personal impact of GH electives, even when accompanied with minimal formal programming. The study adds to the growing body of information about GH and social medicine career trajectories.

We found that a large proportion of trainees who sought GH electives had substantial prior international field experience. They often returned to sites where they had strong ties to build on previous work or initiate new projects. In keeping with Knowle's theories on motivation in adult learning,[29] they sought career specific learning opportunities by building on past experience.

The GH electives improved residents' self-perceived skills as clinicians consonant with findings in previous evaluations, and most significantly in understanding social determinants of health and health systems, and improving cultural competency.[1-7] The learning was foundational for many respondents, with some as far as 12 years out of training reporting that the elective

Table 3. Pediatric Residency Alumni Qualitative Themes of Global Health Elective Career Impact.

Organizing Themes	n	Representative Comments
Career effect	42	
Already planned global health	11	"I already knew I wanted to do global health, but in the field of pediatric oncology. This rotation really got me thinking about what can be done in extreme resource limited settings. I moved on to focus most of my work in more middle-income environments."
		"I was involved in global health work throughout my medical training—almost a parallel track to what I was doing in the US. Everything I do in medicine, the way I look at everything, is affected by this."
Away from global health	2	"Made me realize that I was interested in global health, but not as the core focus of my career."
Into global health	7	"It was indeed 'life altering.' . . . The elective experience during residency was incredibly influential on my career trajectory and my perspective on health disparities, and I am so grateful to have had that opportunity."
		"It made me think seriously about making GH my academic focus which is now the case."
Into research	10	"I gained valuable experience in designing a research project and organizing data collection in a foreign country. This affirmed my desire to continue to do research."
		"Global health has become a focus of my career as I pursue research initiatives in developing and developed countries."
Into public health	3	"It also helped me to see the big picture and realize my interest in international public health, which is my current career."
Into a subspecialty	5	"Based on these electives I decided to dedicate my career to global public health equities (global and local) and also to pursue subspecialty training in infectious diseases."
		"They helped to guide both my clinical focus on GI/nutrition (malnutrition) and my research focus on health services and nutrition."
Into underserved	4	"Affirmed my desire to work directly with underserved children and families and inspired me to do more to advocate for policies that improve global child health."
Personal enrichment and physician skills	39	
Clinical skills	10	"It has provided me with greater appreciation of physiology, medical systems, and their critical interplay."
Cultural competency	10	"I also better appreciate the context in which many of my Central American patients come from. I also certainly have a better understanding about the impact of war on communities and individuals."
Resource utilization	4	"Made much more conscious decisions about health care choices"
Language skills	4	"Improved language skills/ability to communicate with patients. . . . It opened lines of communication with Spanish-speaking patients."
Personal enrichment	11	"It allowed me to form lasting connections with health care providers in an environment of introspection and unified desire to improve a struggling health care system."
		"I heard their stories and they heard mine; I felt I became a better physician from that experience."

shaped their ongoing attitudes for current domestic and GH work.

It is noteworthy that trainees with previous GH experience were more likely to have on-site mentorship. While our data failed to show a correlation between mentorship and the outcomes we measured, literature supports that faculty mentorship ensures appropriate supervision and reduces the imposition on global partners.[1,30]

"Duration of elective" and "cumulative elective time" correlated with greater elective outcomes. Across GME, stringent ACGME requirements and constraints on resident time may leave programs with minimal flexibility to schedule GH electives. To achieve their educational goals, trainees often combine vacation with 2-week electives to extend their GH elective time—a practice that may be detrimental from a mental health perspective given the intensity of GH electives.[31]

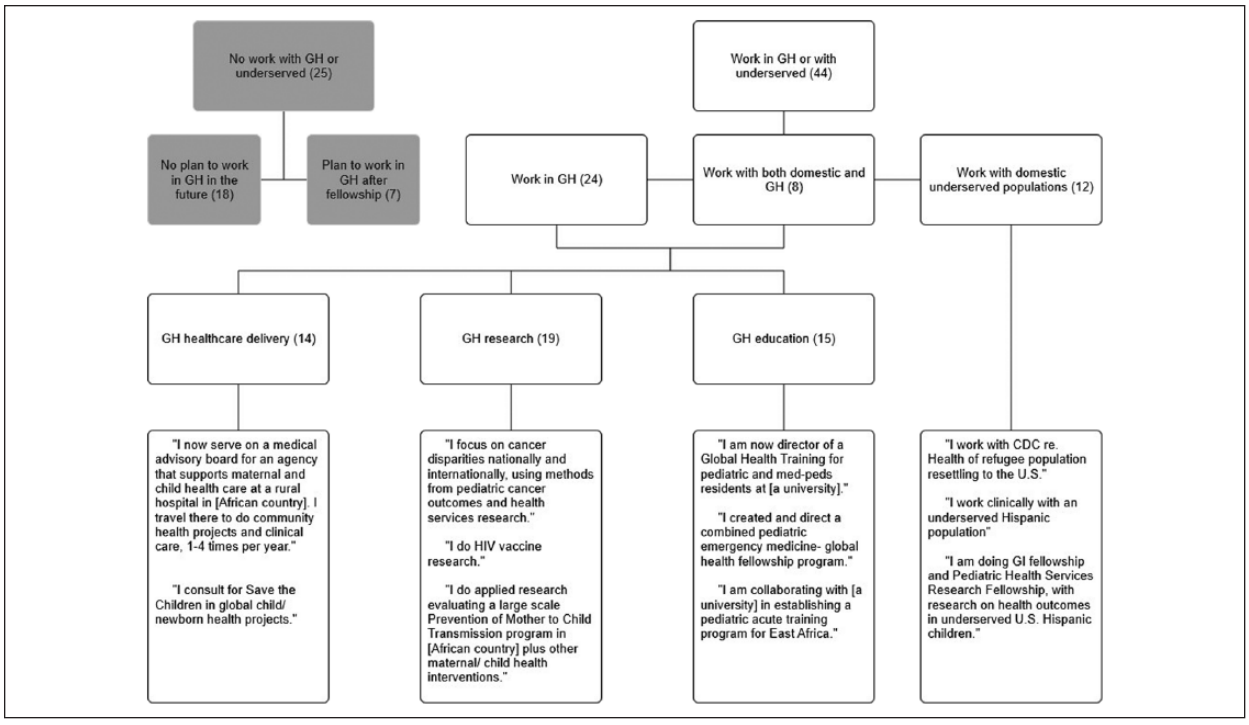

Figure 2. Ongoing careers in global health.

Individualized learning has become a priority in pediatric training. While the call for all pediatricians to have some GH training has been made, those trainees who intend to build GH careers are best served by having dedicated time in the field, much as subspecialty fields provide dedicated time in the subspecialty clinic or laboratory.[8,32] The data presented here support ongoing development of GH "tracks" that may facilitate a seamless path into one of multiple post-residency GH education opportunities.[25]

While some pediatric leaders have expressed concern about career prospects in GH, our results indicate that there are rewarding, high-impact career opportunities seeking well-qualified pediatricians. Of the 44 Boston Combined Residency graduates from 2003 to 2012 who described ongoing careers involving GH and work with the underserved, over half held research and teaching positions focused exclusively in the field of GH.

Our study has a number of limitations. We surveyed alumni only from the Boston Combined Residency program, whose selection committee looks favorably on GH experience as a marker of initiative and leadership. Our response rate was limited by not having contact information for 28 (21%) of the residents who had received travel funds and by a 66% response rate among those whom we did contact. We relied on self-reports of scholarly products and self-assessments of learning, raising risk of inherent "social response" bias, which we tried to minimize by designing questions about the impact of the elective rather than the respondents' assessments of their own competencies, and by providing detailed anchor statements to Likert-type scales. We also did not evaluate GH elective effects on host institutions or communities, an area that needs further exploration.

Conclusion

Residency training programs are challenged to train physicians who are globally competent, particularly trainees who desire careers combating worldwide disease and disability and closing untenable health disparities. This study points to a high number of residents with experience and career aspirations in GH, the scholarly and educational products of their GH electives, and a correlation between the amount of time spent on GH electives and alumni perception of impact. GH electives for pediatric residents can be life-altering experiences that alter ultimate career choices. Trainees with interest in GH should be supported with individualized GH electives that meet their learning needs and allow them to continue contributing to their chosen field during residency training and beyond.

Appendix

Resident Global Health Elective Outcomes Survey

Study Title:
Pediatric Resident Global Health Electives Outcomes Survey

What is the purpose of this study?
To explore outputs and outcomes of global health rotations done during pediatric residency

Who can participate in this study?
You are being asked to participate in this study because you are an alumni of the Boston Children's Hospital residency or Boston Combined Residency Program who received funding for international travel during residency.

What do I have to do if I'm in the study?
To participate in the study you will be asked to fill out this survey. Participation is completely voluntary.

What is the time commitment for the study?
The survey should take about 10 minutes to complete, or 15-20 minutes if you visited multiple elective sites.

What will I receive for participating?
There are no costs for you to participate and you will not be paid to participate. There is no direct benefit to you for participating in the study, though you will receive results via email at the end of the study.

Regarding Confidentiality:
The survey data will be collected using password protected software at Boston Children's Hospital. You may choose not to participate and you may withdraw from the survey at any time without penalty. You may also skip any question you are not comfortable answering. Responses will be identifiable by the PI due to known compiled lists of trainees who have traveled; however identifying information will not be distributed or used in publication. You may inadvertently divulge identifying information in the free text responses particularly related to career development and elective outcomes. During data analysis, such information will be removed.

If you have questions about data confidentiality or breach of confidence, please contact the PI, Dr. Christiana Russ, christiana.russ@childrens.harvard.edu, or 617 355 5345.

Consent to participate:
By completing the survey, you acknowledge that you have read this information and agree to participate in this research, with the knowledge that you are free to withdraw your participation at any time without penalty.

Survey:

1. How many global health rotations did you do during residency? (1/2/3)
   1a. If you did more than one funded global health rotation, how many sites did you visit?
   1/2/3
   If you received multiple funding awards for travel during residency to multiple sites, we will ask you the next several questions for each specific elective rotation site.
2. In which year did you do the elective rotation supported by Schliesman, Von L Meyer or departmental funds?
3. What country did you travel to?
4. What city or region did you travel to?
5. What was the name of the hospital, clinic or organization you worked with?
6. Was this site in a formal partnership with the training program? Yes/No
7. How long were you on site? (____ weeks)
8. How much international field experience did you have prior to this elective rotation?

a. None
b. ___ months

9. Had you traveled to this site prior to this elective rotation? Yes/No

10. Did you travel to this site again either during or after residency? Yes/No

    8a. If yes, how much time did you spend at this site in total? (months)

11. What was the primary goal of this elective rotation?
    a. Gain clinical experience
    b. Do a research project
    c. Do a community health project
    d. Do a medical education project
    e. Other
    i. Please describe the other primary goal_____
12. Please indicate any secondary goals for this elective rotation (mark all that apply)
    a. Gain clinical experience
    b. Do a research project
    c. Do a community health project
    d. Do a medical education project
    e. Other
    i. Please describe the other secondary goals_____
    f. None
13. To the best of your ability, please describe what your host community or institution contributed to your global health rotation (mark all that apply)
    a. Arrangement of accommodation which you paid for
    b. Arrangement of accommodation which they provided
    c. Arrangement of transportation which you paid for
    d. Arrangement of transportation which they provided
    e. Time spent by host faculty or staff in teaching you
    f. Time spent by host faculty or staff in mentoring your project or research
    g. Volunteer time spent by host staff on your project or research
    h. Paid time spent by host staff on your project or research
    i. Other
        i. Please describe the other host contribution _____
14. Was your travel or project mentored?
    a. Yes by a BCRP faculty member
    b. Yes by an on-site clinician/faculty member
    c. Yes by **both** a BCRP faculty member and on-site clinician
    d. No
15. Please describe how you spent your time during this elective.

    _____

    _____

    _____

16. Please indicate which outputs you achieved from this experience (mark all that apply):
    a. Personally improved clinical exam skills
    b. Personally improved teaching skills
    c. Personally improved research skills
    d. Formally taught residents, medical students and/or staff at host site
    e. Presented a global health case to other residents upon return
    f. Presented work at a national conference
    g. Published work in a peer reviewed journal
    h. Completed curriculum or developed educational tools for on-site medical trainees
    i. Completed curriculum or developed educational tools for community education
    j. Other
        i. Please describe the other outputs _____

17. Please assess how much your global health elective contributed to your knowledge and skill in diagnosing and treating pediatric diseases in all settings (domestic and international).

1	2	3	4
No impact: Did not change the way you care for your patients	**Mild impact:** slightly changed your approach to certain patients	**Moderate impact:** Changed your approach to groups of patients	**Large impact:** Changed your approach to most patients

18. Please assess how much your global health elective changed your awareness of political, cultural, environmental and social factors and their effect on child health in all settings (domestic and international).

1	2	3	4
No impact: Did not change the way you care for your patients	**Mild impact:** slightly changed your approach to certain patients	**Moderate impact:** Changed your approach to groups of patients	**Large impact:** Changed your approach to most patients

19. Please assess how much your global health elective changed your appreciation for benefits and drawbacks of different systems of healthcare and local, national and international efforts to improve child health in all settings (domestic and international).

1	2	3	4
No impact: Did not change the way you interact with and understand healthcare systems	**Mild impact:** slightly changed the way you interact with and understand healthcare systems	**Moderate impact:** Changed the way you interact with and understand healthcare systems in some situations	**Large impact:** Changed the way you interact with and understand healthcare systems in most situations

20. Please assess how much your global health elective contributed to your career development.

1	2	3
Career Neutral: Did not change your career course or opportunities	**Career Affirming or Expanding:** opened new career avenues or opportunities	**Career Altering:** Transformational. Altered your career course

21. Please describe how your global health elective affected your career, if at all.

_____

_____

22. Have you continued work in global health or with underserved populations after residency? Yes/No
    a. If yes, please describe how

_____

_____

We may do follow up interviews with a selection of survey participants. If you would be willing to be contacted for this please provide your email address below.
Thank you for your time.

Acknowledgments

The authors wish to thank Dr Frederick Lovejoy for his support of this work and assistance in identifying study participants, and Drs. Ted Sectish and Bob Vinci for their ongoing support of global health programming.

Authors' Note

Ethical approval was granted by the Boston Children's Hospital Institutional Review Board (IRB-P00010672); December 5, 2013.

Author Contributions

CR: Contributed to conception and design; contributed to acquisition; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

TT: Contributed to design; contributed to acquisition, analysis, and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

MS: Contributed to design; contributed to analysis and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

JP: Contributed to conception and design; contributed to analysis and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

1. Jeffrey J, Dumont RA, Kim GY, Kuo T. Effects of international health electives on medical student learning and career choice: results of a systematic literature review. *Fam Med*. 2011;43:21-28.
2. Kamat D, Armstrong RW; Association of Medical School Pediatric Department Chairs, Inc. Global child health: an essential component of residency training. *J Pediatr*. 2006;149:735-736.
3. Garfunkel LC, Howard CR. Expand education in global health: it is time. *Acad Pediatr*. 2011;11:260-262.
4. Federico SG, Zachar PA, Oravec CM, Mandler T, Goldson E, Brown J. A successful international child health elective: the University of Colorado Department of Pediatrics' experience. *Arch Pediatr Adolesc Med*. 2006;160:191-196.
5. Gladding S, Zink T, Howard C, Campagna A, Slusher T, John C. International electives at the University of Minnesota Global Pediatric Residency Program: opportunities for education in all Accreditation Council for Graduate Medical Education competencies. *Acad Pediatr*. 2012;12:245-250.
6. Gupta AR, Wells CK, Horwitz RI, Bia FJ, Barry M. The International Health Program: the fifteen-year experience with Yale University's Internal Medicine Residency Program. *Am J Trop Med Hyg*. 1999;61:1019-1023.
7. Sawatsky AP, Rosenman DJ, Merry SP, McDonald FS. Eight years of the Mayo International Health Program: what an international elective adds to resident education. *Mayo Clin Proc*. 2010;85:734-741.
8. Pitt MB, Gladding SP, Suchdev PS, Howard CR. Pediatric global health education: past, present, and future. *JAMA Pediatr*. 2016;170:78-84.
9. Crump JA, Sugarman J; Working Group on Ethics Guidelines for Global Health Training. Ethics and best practice guidelines for training experiences in global health. *Am J Trop Med Hyg*. 2010;83:1178-1182.
10. Dowell J, Merrylees N. Electives: isn't it time for a change? *Med Educ*. 2009;43:121-126.
11. Edwards R, Piachaud J, Rowson M, Miranda J. Understanding global health issues: are international medical electives the answer? *Med Educ*. 2004;38:688-690.
12. Drain PK, Primack A, Hunt DD, Fawzi WW, Holmes KK, Gardner P. Global health in medical education: a call for more training and opportunities. *Acad Med*. 2007;82:226-230.
13. Petrosoniak A, McCarthy A, Varpio L. International health electives: thematic results of student and professional interviews. *Med Educ*. 2010;44:683-689.
14. Bozinoff N, Dorman KP, Kerr D, et al. Toward reciprocity: host supervisor perspectives on international medical electives. *Med Educ*. 2014;48:397-404.
15. Torjesen K, Mandalakas A, Kahn R, Duncan B. International child health electives for pediatric residents. *Arch Pediatr Adolesc Med*. 1999;153:1297-1302.
16. Stanton B, Huang CC, Armstrong RW, et al. Global health training for pediatric residents. *Pediatr Ann*. 2008;37:786-787, 792-786.
17. Lukolyo H, Rees CA, Keating EM, et al. Perceptions and expectations of host country preceptors of short-term learners at four clinical sites in Sub-Saharan Africa. *Acad Pediatr*. 2016;16:387-393.
18. McCarthy AE, Petrosoniak A, Varpio L. The complex relationships involved in global health: a qualitative description. *BMC Med Educ*. 2013;13:136.
19. Balmer DF, Marton S, Gillespie SL, Schutze GE, Gill A. Reentry to pediatric residency after global health experiences. *Pediatrics*. 2015;136:680-686.
20. Thompson MJ, Huntington MK, Hunt DD, Pinsky LE, Brodie JJ. Educational effects of international health electives on U.S. and Canadian medical students and residents: a literature review. *Acad Med*. 2003;78:342-347.
21. Liaw W, Bazemore A, Xierali I, Walden J, Diller P. Impact of global health experiences during residency on graduate practice location: a multisite cohort study. *J Grad Med Educ*. 2014;6:451-456.
22. Butteris S, Schubert CJ, Batra M, et al. Global health education in U.S. pediatric residency programs. *Pediatrics*. 2015;136:458-465.
23. Nelson BD, Lee AC, Newby PK, Chamberlin MR, Huang CC. Global health training in pediatric residency programs. *Pediatrics*. 2008;122:28-33.
24. Anspacher M, Frintner MP, Denno D, et al. Global health education for pediatric residents: a national survey. *Pediatrics*. 2011;128:e959-e965.

25. Suchdev PS, Shah A, Derby KS, et al. A proposed model curriculum in global child health for pediatric residents. *Acad Pediatr*. 2012;12:229-237.
26. Kellogg Foundation. *Logic Model Development Guide: Using Logic Models to Bring Together Planning, Development and Action*. Battle Creek, MI: Kellogg Foundation; January 2004.
27. Armstrong EG, Barsion SJ. Using an outcomes-logic-model approach to evaluate a faculty development program for medical educators. *Acad Med*. 2006;81:483-488.
28. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform*. 2009;42:377-381.
29. Knowles MS, Holton EE III, Swanson RA. *The Adult Learner*. 7th ed. Oxford, England: Elsevier; 2011.
30. Nelson BD, Kasper J, Hibberd PL, Thea DM, Herlihy JM. Developing a career in global health: considerations for physicians-in-training and academic mentors. *J Grad Med Educ*. 2012;4:301-306.
31. Schutze GE. The way forward for global health training programs. *Pediatrics*. 2015;136:571-572.
32. Arnold LD. Improving global child health: why all pediatricians must "be the change." *Pediatrics*. 2016;137: e20152748.