Impact of Global Health Education on Pediatric Residency Applicants' Rank-List and Decision Process

Kriti Puri[2], Jonathan Castillo[2], Heidi Castillo[2], Jareen Meinzen-Derr[3], Charles Schubert[3]

**Corresponding author:** Dr Jonathan Castillo jcporter@texaschildrens.org

**Institution:** 2. Baylor College of Medicine, Texas Children's Hospital, 3. Cincinnati Children's Hospital Medical Center

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**Abstract**

**Background:** The globalization of healthcare has contributed to a rapid increase in global health education (GHE) among residency programs. However the impact of GHE on pediatric residency selection and potential barriers to GHE have not been reported.

**Objective:** Our objective was to identify associations between resident ranking preferences and, 1) past GHE experience, and 2) interest in GHE participation in future.

**Methods:** Residents entering a large urban academic pediatric residency program from 2009 to 2014 were surveyed, to identify factors influencing pediatric residency program selection and the role of GHE in ranking and career decisions.

**Results:** 86.5% (n=294) of the 340 entering residents responded (67.2% female; 74.6% white; mean age [SD] of 27 years [2.3]). About 50% (n=147) had prior GHE experience, and 90.4% endorsed interest in participating in GHE rotations. Availability of faculty mentorship, financial support, and personal safety were the most important factors influencing interest in participation. Non-white residents were more likely than white residents to have prior GHE experience (p=0.02). Residents with prior GHE experience were more familiar with the program's GHE opportunities prior to submitting their rank-lists (p=0.004). They gave greater importance to availability of GHE opportunities, in-country (p<0.001) and away (p<0.001), during the ranking process, while the geographical location of a residency program was less important (p=0.02).

**Conclusion:** Our results document significant interest in GHE among incoming pediatric residents, and significant impact of availability of GHE on residency program selection. Availability of mentorship and financial support are
important to pediatric residents interested in GHE.

**Keywords:** global health education; pediatrics; residency

**Introduction**

Global health is increasingly being defined as "an area for study, research, and practice that places a priority on improving health and achieving health equity for all people worldwide" (Koplan et al., 2009). Global health education (GHE) incorporates the socioeconomic as well as medical knowledge needed to provide optimal healthcare to areas and peoples with healthcare resource limitation, in any part of the world. In our ever-changing and rapidly shrinking world, health care has become considerably more diverse and demanding in terms of the pathology addressed, due to increased international travel, immigration, as well as the return of deployed military troops and medical personnel from abroad (Aagaard et al., 2005; Castillo et al., 2012; Castillo, Goldenhar, Baker, Kahn, & Dewitt, 2010; Eddy & Sase, 2015; Nelson, Lee, Newby, Chamberlin, & Huang, 2008; Nuthalapaty, Jackson, & Owen, 2004). Hence medical students, medical schools, and residency programs are becoming more interested in incorporating GHE into medical education curricula (Association of American Medical Colleges, 2011, 2014; Stoltenberg, Rumas, & Parsi, 2012). Moreover, desired experience in tropical medicine and infectious diseases, and exposure to health economics and resource stewardship principles motivate medical professionals to seek out GHE.

The choice of a residency training program is one of the most crucial decisions made by medical students. During the residency program selection in the United States (USA), there is a ranking and matching process. Residency applicants interview at multiple centers, and then the institutions as well as the applicants submit their respective list of choices in order of preference. The residency match is then decided based on an algorithm which takes into account both the applicants’ choice order as well as the centers’ ranked list of applicants. The factors that applicants from specialties including internal medicine, surgery, family medicine and emergency medicine have previously reported to consider as important when making this rank list are geographic location of the residency program, reputation/ranking, and educational opportunities available (Aagaard et al., 2005; Flynn, Gerrity, & Berkowitz, 1993; Love et al., 2012; Nuthalapaty et al., 2004; Yarris, Deiorio, & Lowe, 2009). In addition, subjective factors, such as general environment, happiness of residents, and their overall impression on the day of their interview, are also important considerations. There is mounting interest in the impact of the availability of GHE opportunities on residency programs’ recruitment success in the United States, and a few specialties have reported factors influencing residency program selection (Aagaard et al., 2005; Bazemore et al., 2007; Dey, Grabowski, Gebreyes, Hsu, & VanRooyen, 2002; Flynn et al., 1993; Love et al., 2012; Nuthalapaty et al., 2004; Shull et al., 2014; Yarris et al., 2009). However, little is known about the nature and impact of various factors, including specifically the availability of GHE, on the rank list process of pediatric residency applicants (Butteris et al., 2015). Thus, the purpose of our study was to describe factors associated with pediatric residency program ranking by residency applicants in the United States, over six consecutive years. We hypothesized that the availability of GHE opportunities would be a significant influence on applicants and that the prior GHE experience and future interest of pediatric residency applicants in GHE would increase over time.

**Methods**

A cross-sectional survey in the form of a self-administered questionnaire was carried out among six consecutive...
classes of incoming residents at Cincinnati Children’s Hospital Medical Center (CCHMC), a large urban pediatric residency program, from 2009 through 2014. All residents, including dual- and triple-board track residents, were offered the survey within the first month of residency and written informed consent was obtained. No remuneration/incentive was provided, and the responses were anonymous.

The survey gathered information regarding demographics, importance of various factors in determining residency rank-lists, interest in participation in GHE activities during residency and in future, and perceived potential barriers to participation in GHE. The responses were gathered via a Likert scale. Importance of factors determining residency rank lists was ranked from -3, -2, -1, 0, 1, 2 and 3, indicating in order the most negative impact to the most positive impact. Potential barriers to GHE were ranked based on agreement with a statement that the listed factor was an important consideration for pursuit of GHE (for example, ‘financial support’). These responses ranged from 1 = ‘strongly disagree’, 2 = ‘disagree’, through 3 = ‘neutral’, to 4 = ‘agree’ and 5 = ‘strongly agree’.

**Analysis:** Descriptive statistics were analyzed and presented as percentages, frequencies and proportions, and mean +/- SD. Categorical variables were assessed using chi-square test, and continuous variables were assessed using Student’s t-test. For analysis, the Likert scale responses to the importance of factors for residency rank lists and importance of factors for pursuit of GHE were simplified to 1 = including all ‘negative’/’disagree’ responses, 2 = ‘neutral’/’0’ responses, and 3 = including all ‘positive’/’agree’ responses. Characteristics were compared between residents with and without interest in GHE. Characteristics and importance of rank-list factors and GHE barriers were also compared between residents with and without prior experience in GHE.

This study was approved by the CCHMC Institutional Review Board (IRB).

**Results**

**Demographics:** With a participation rate of 86.5%, 294 residents (of the total 340 over the six year study period) agreed to participate; overall characteristics are summarized in Tables 1 and 2. Data were analyzed from all questionnaires, including those that were incompletely filled (7/294, 2.4%), thus the number of respondents for each parameter is specified separately hereafter. The residency population was primarily female (67.2%, 197 of 293). The racial profile was predominantly white (74.6%, 217 of 291), along with 6.9% (20 of 291) African-American, 5.5% (16 of 291) Hispanic, and 8.9% (26 of 291) Asian. The mean age of incoming residents was 27.0 years (standard deviation SD 2.3 years). Over the six years of the study, the sex ratio, racial profile, and mean age for the incoming class of residents did not differ significantly (p>0.1).

Of the 293 respondents, 50.2% (147 of 293) reported prior GHE experience (defined as a formal rotation in GHE or a medical mission) at one or more stages of their career (Table 1). Twenty-six had had the experience in college, 106 had a GHE experience in medical school, 20 in other medical missions between periods of study, and 5 reported having had a GHE experience in both college and medical school. The location of the experience ranged across the globe, representing five continents including Latin America (n=84), Africa (n=29), Asia (n=24), Europe (n=8), and Australia (n=2). Of note, during the study period, the percentage of residents with prior GHE experience trended towards increase, ranging from 36.5% (19 of 52) in 2009, 51.8% in 2010, 57.1 % in 2011, 52.1% in 2012, 53.1% in 2013, and 51% (25 of 49) in 2014, but this difference did not reach statistical significance (p=0.099). Specifically, the percentage of residents with prior GHE experience during medical school also trended towards increase from 2009 to 2014. 90.4% (265 of 293 respondents) reported interest in participating in GHE through an away international rotation. When offered the opportunity to participate in GHE without traveling internationally, the percent of residents interested in participation increased to 95.2% (280 of 294 respondents).
### Table 1. Characteristics of incoming pediatric residents at CCHMC from 2009-2014

<table>
<thead>
<tr>
<th>DEMOGRAPHICS</th>
<th>2009 (n=53)</th>
<th>2010 (n=56)</th>
<th>2011 (n=56)</th>
<th>2012 (n=48)</th>
<th>2013 (n=32)</th>
<th>2014 (n=49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sesso (n=293)</td>
<td>Male</td>
<td>32.8 (96)</td>
<td>32.1 (17/53)</td>
<td>28.6 (16/56)</td>
<td>30.4 (17/56)</td>
<td>33.3 (16/48)</td>
</tr>
<tr>
<td>Sesso</td>
<td>Female</td>
<td>67.2 (197)</td>
<td>67.9 (36/53)</td>
<td>71.4 (40/56)</td>
<td>69.6 (39/56)</td>
<td>66.7 (32/48)</td>
</tr>
<tr>
<td>Age (n=281; Mean, S.D.)</td>
<td>2009 (n=53)</td>
<td>2010 (n=56)</td>
<td>2011 (n=56)</td>
<td>2012 (n=48)</td>
<td>2013 (n=32)</td>
<td>2014 (n=49)</td>
</tr>
<tr>
<td>26.81 (2.29)</td>
<td>27.05 (2.29)</td>
<td>26.51 (1.73)</td>
<td>26.65 (1.77)</td>
<td>27.7 (2.36)</td>
<td>27.45 (2.98)</td>
<td></td>
</tr>
<tr>
<td>Race (n=291)</td>
<td>White (non-Hispanic)</td>
<td>74.6 (217)</td>
<td>84.9 (45/53)</td>
<td>72.7 (40/56)</td>
<td>76.8 (43/56)</td>
<td>60.4 (29/48)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>5.5 (16)</td>
<td>4.9 (5/53)</td>
<td>5.4 (5/56)</td>
<td>5.4 (5/56)</td>
<td>12.5 (6/48)</td>
<td>3.2 (1/31)</td>
</tr>
<tr>
<td>Other</td>
<td>4.1 (12)</td>
<td>2.7 (1/53)</td>
<td>10.9 (6/55)</td>
<td>5.6 (3/56)</td>
<td>22.3 (6/32)</td>
<td>0 (0/31)</td>
</tr>
<tr>
<td>Prior knowledge of ACGME (n = 241)</td>
<td>Yes</td>
<td>33.2 (80)</td>
<td>44.6 (25/56)</td>
<td>23.2 (13/56)</td>
<td>35.4 (17/48)</td>
<td>40.6 (13/32)</td>
</tr>
<tr>
<td>Prior knowledge of CCHMC GHE program (n=294)</td>
<td>Yes</td>
<td>87.8 (258)</td>
<td>75.5 (40/53)</td>
<td>94.6 (53/56)</td>
<td>87.5 (49/56)</td>
<td>93.7 (45/48)</td>
</tr>
<tr>
<td>Program (n=292)</td>
<td>Pediatrics</td>
<td>36</td>
<td>40</td>
<td>37</td>
<td>39</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Med-Peds</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>10</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Previous GHE experience (n=293)</td>
<td>Total</td>
<td>50.2 (147)</td>
<td>56.5 (95/2)</td>
<td>51.8 (29/56)</td>
<td>57.1 (32/56)</td>
<td>52.1 (25/48)</td>
</tr>
<tr>
<td></td>
<td>College</td>
<td>71.1 (4/56)</td>
<td>8.8 (9/56)</td>
<td>6.2 (3/48)</td>
<td>10.0 (5/48)</td>
<td>18.4 (10/32)</td>
</tr>
<tr>
<td></td>
<td>Medical School</td>
<td>19.2 (10/52)</td>
<td>28.6 (16/56)</td>
<td>48.2 (22/48)</td>
<td>43.7 (21/48)</td>
<td>34.4 (11/32)</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>17.3 (9/52)</td>
<td>16.1 (9/56)</td>
<td>2.2 (1/36)</td>
<td>3.1 (1/32)</td>
<td>-</td>
</tr>
<tr>
<td>Interest in international rotations (n=293)</td>
<td>90.4 (265/293)</td>
<td>94.5 (50/53)</td>
<td>92.9 (52/56)</td>
<td>91.1 (51/56)</td>
<td>95.8 (46/48)</td>
<td>81.2 (26/32)</td>
</tr>
<tr>
<td>Interest in GHE without need to travel (n=294)</td>
<td>95.2 (280/294)</td>
<td>96.2 (51/53)</td>
<td>94.6 (53/56)</td>
<td>96.4 (54/56)</td>
<td>100 (48/48)</td>
<td>84.4 (27/32)</td>
</tr>
</tbody>
</table>

# n=294 for total respondents overall, including incomplete questionnaires; ‘n’ for each specific parameter determined by number of responses received for each respective question

% 5/26 respondents in 2014 had GHE experience at both college and medical school level

**Factors Affecting Decision of Ranking Order (Table 2):** The residents were asked about the importance of the following factors: geographic location of residency program, quality of faculty and residents, the program’s reputation, preference of their significant other, and GHE opportunities. Overall, location emerged as a positive factor for 76.6% (223 of 291), neutral for 14.1% (41 of 291), and a negative factor for 9.3% (27 of 291) of the respondents. Perceived quality of faculty and residents impacted almost everyone’s decision positively (99.7%, 292 of 293 respondents). ‘Quality’ was included as a subjective term, encompassing qualifications, seniority, research experience, and professional reputation. The reputation of the residency program was a positive factor for 98% (287 of 293), and a neutral factor for 2% (6 of 293) of the respondents. The preference of the significant other was a positive factor for 51% (149 of 292) and a neutral factor for 42.8% (125 of 292) of the respondents. GHE opportunities positively impacted decision for 69.2% (202 of 292), and had a neutral effect on 28.8% (84 of 292) of the respondents.

### Table 2. Factors in resident decision-making process regarding ranking programs and participation in GHE

<table>
<thead>
<tr>
<th>FACTORS IMPORTANT FOR RANK-LIST</th>
<th>N</th>
<th>AGREE (%)</th>
<th>NEUTRAL (%)</th>
<th>DISAGREE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of Location</td>
<td>291</td>
<td>76.6 (223/291)</td>
<td>14.1 (41/291)</td>
<td>9.3 (27/291)</td>
</tr>
<tr>
<td>Quality of Faculty</td>
<td>293</td>
<td>99.7 (292/293)</td>
<td>0.3 (1/293)</td>
<td>0.0 (0/293)</td>
</tr>
<tr>
<td>Quality of Residents</td>
<td>293</td>
<td>99.7 (292/293)</td>
<td>0.3 (1/293)</td>
<td>0.0 (0/293)</td>
</tr>
</tbody>
</table>
## Participation in GHE and Plan for GHE in Future Career (Table 2): When asked about the future, 50.8% (122 of 240) of the respondents stated that they planned for GHE to play an important role in their future careers. When asked about the factors that might affect their decisions to pursue GHE, mentorship within the program was important for 91.7% (220 of 240), whereas faculty support at the away location was a significant concern for 82.9% (199 of 240). Financial support was an important factor for 85% (204 of 240) while 80.8% (194 of 240) reported personal safety to be an important consideration. Notably, overall, 51.5% (123 of 239) of the respondents were willing to use their vacation time for GHE.

## Characteristics of Residents Expressing Interest in GHE (Table 3): The responses were compared between residents who expressed interest in GHE (including GHE opportunities without travel) and those who reported no interest. The demographic characteristics of the two groups were similar. Residents reporting interest in GHE were more likely to know about the GHE program at CCHMC prior to orientation (p=0.003). They gave less importance to the reputation of the program while preparing the rank list (p=0.014) and more importance to the availability of GHE opportunities (p=0.007) and opportunities for international rotations (p=0.005). As might be expected, they were also more likely to be interested in keeping GHE as an important part of their future careers (p<0.001) and to be willing to use vacation time to participate in GHE (p=0.001). Mentorship within the program, personal safety and consideration of time spent away from home were significant concerns for both groups.

### Table 3. Differences between incoming residents’ interested versus not interested in GHE

<table>
<thead>
<tr>
<th>Characteristic/Interest in GHE</th>
<th>Interest in GHE</th>
<th>Interest in GHE</th>
<th>p-value (t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (S.D)</td>
<td>26.93 (2.24)</td>
<td>27.71 (2.61)</td>
<td>0.79</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>89/190</td>
<td>7/7</td>
<td>0.24</td>
</tr>
<tr>
<td>Race (white/non-white)</td>
<td>207/71</td>
<td>10/3</td>
<td>1.00</td>
</tr>
<tr>
<td>Prior knowledge about CCHMC GHE track (yes/no)</td>
<td>250/30</td>
<td>8/6</td>
<td>0.003*</td>
</tr>
<tr>
<td>FACTORS IMPORTANT WHILE RANKING – mean simplified score (S.D.)</td>
<td>2.67 (0.64)</td>
<td>2.79 (0.58)</td>
<td>0.47</td>
</tr>
</tbody>
</table>
Impact of Previous Experience in GHE (Table 4): The groups of residents with and without prior experience in GHE were also compared to each other to determine the impact of prior exposure on future interest and perceived barriers. Non-white residents were more likely to have prior GHE experience than white residents (p=0.021). Residents with prior experience were more likely to be familiar with the GHE opportunities at CCHMC (p=0.004) and also give more importance to the availability of such opportunities (p<0.001), specifically international rotations (p<0.001), when deciding rank order. Interestingly, they gave less weight to the location of a program when deciding rank order (p=0.021). When asked about plans for residency, they were more likely to be willing to use vacation time for gaining GHE experience (p<0.001). They were also more concerned about the financial support available for travel during GHE rotations (p=0.012). They also reported more interest in including GHE as an important part of their future careers (p<0.001).

### Table 4. Differences between incoming pediatric interns at CCHMC with and without previous GHE experience

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Previous GHE experience</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
</tr>
<tr>
<td>Age [yrs, mean (S.D.)]</td>
<td>26.73 (1.87)</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>41/106</td>
</tr>
<tr>
<td>Race (white/non-white)</td>
<td>101/46</td>
</tr>
<tr>
<td>Prior knowledge about CCHMC GHE program</td>
<td>137/10</td>
</tr>
</tbody>
</table>

### FACTORS IMPORTANT WHEN RANKING PROGRAMS – mean simplified score (S.D.)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Preference of partner/spouse (n=292)</th>
<th>GH education opportunities (n=292)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.44 (0.61)</td>
<td>2.70 (0.48)</td>
</tr>
<tr>
<td></td>
<td>2.64 (0.63)</td>
<td>2.07 (0.73)</td>
</tr>
<tr>
<td></td>
<td>0.26</td>
<td>0.007*</td>
</tr>
</tbody>
</table>

* - p-value significant at <0.05
Quality of faculty (n=289) 2.99 (0.08) 3.00 (0.00) 0.319
Quality of residents (n=289) 2.99 (0.08) 3.00 (0.00) 0.319
Reputation of program (n=289) 2.97 (0.16) 2.99 (0.12) 0.420
Preference of partner/spouse (n=289) 2.39 (0.60) 2.50 (0.61) 0.141
Availability of international rotation (n=289) 2.88 (0.32) 2.49 (0.50) <0.001*
GHE opportunities (n=289) 2.86 (0.36) 2.47 (0.57) <0.001*

FACTORS RELATING TO PARTICIPATION IN GHE ACTIVITIES DURING RESIDENCY – mean simplified score (S.D.)

Plan to include GHE in future career (n=240) 2.68 (0.56) 2.00 (0.72) <0.001*
Willing to use vacation for GHE rotation (n=239) 2.50 (0.68) 2.09 (0.86) <0.001*
Financial consideration (n=240) 2.89 (0.38) 2.74 (0.51) 0.012*
Personal time/safety consideration (n=240) 2.80 (0.42) 2.73 (0.58) 0.276
Concern about mentor at home site (n=240) 2.93 (0.26) 2.88 (0.37) 0.277
Concern about faculty support at away site (n=240) 2.82 (0.42) 2.79 (0.47) 0.658

* - p-value significant at <0.05

Discussion

In this era of rapidly increasing prior global health experience among residency applicants, this is the first study to document factors important to applicants, including those with GHE interest, when selecting a pediatric residency program, and barriers to pursuit of GHE. Over a six year period, we noted trends of greater number of incoming residents with significant prior GHE, and significant impact of GHE opportunities on residency program selection. In addition we document that mentorship and financial support are components perceived as important to pediatric residents interested in GHE participation. We hope that our findings help inform residency program directors and faculty across the USA who are looking to design a GHE program and potentially enhancing resident recruitment (Shull et al., 2014).

As the definition of global health and GHE evolves and becomes more inclusive of all regions suffering from health disparities, there is increasing interest in GHE across learners, from prospective medical students to residents (Association of American Medical Colleges, 2011, 2014; Stoltenberg et al., 2012). Even within our institution, we previously reported that among all residents (all years of training) during the year 2010-11, 84% of respondents were interested in GHE, and 70% were interested in participating in an away international elective rotation during their training (Nelson et al., 2008). In comparison, over our study period of six years, we now report higher levels of interest (approximately 95% and 90%, respectively), even among incoming residents. We found that residents who had previous experience were more likely to be interested in GHE and to plan to integrate GHE into their careers. Notably, the number of residents interested in GHE is consistently higher than the number interested in international away electives. This finding may indicate that the rising interest in GHE is a true trend, with the residents being aware of the comprehensive definition of GHE, and not merely a result of desire for travel.
The importance given to the availability of GHE opportunities when ranking residency programs, and the improvement in the matching performance of programs that introduce a GHE track are surrogate markers of increasing interest in GHE. We found that applicants with an interest in GHE were more likely to be aware of CCHMC’s GHE curriculum, and GHE was a more significant factor for them when ranking a program. This finding is consistent with a number of studies from other subspecialties (Bazemore et al., 2007; Dey et al., 2002; Monroe-Wise et al., 2014; Shull et al., 2014), however, to our knowledge, this is the first report from a large pediatric residency program. To keep pace with this interest among residents, pediatric residency programs have increasingly tried to develop, offer, and publicized their GHE activities (Castillo, Castillo, & Dewitt, 2011). In the academic year 2013-14, 64% of pediatric residency programs reported offering domestic or international GHE opportunities and about 25% had a dedicated GHE track (Butteris et al., 2015). Yet, the development of such educational experiences is not without challenges. Perceived barriers to pursuing GHE as reported by previous surveys of program directors include: difficulty securing funding, lack of Accreditation Council for Graduate Medical Education (ACGME) approval for the electives, inadequate staffing for adequate coverage of the home institution, concern about the development and sustainability of partnerships between home and ‘away’ institutions, and lack of pre-travel orientation and/or post-travel debriefing (Bussell, Kihlberg, Foderingham, Dunlap, & Aliyu, 2015; Butteris et al., 2015; Castillo et al., 2011; Coombs, Feldman, Lauer, Paul Chan, & Sun, 2015; Knudson, Tarpley, & Numann, 2015; Tsai et al., 2014; Tupesis et al., 2012).

We found that applicants with an interest in GHE were more likely to be planning for GHE to play an important role in their career paths. Although they were willing to devote their vacation time to the pursuit of GHE, availability of financial support, mentorship at the site, personal safety, and extent of time away from home emerged as consistently important factors over time, indicating the roles of these aspects as potential barriers to learners interested in obtaining GHE. In our program, we have tried to mitigate these factors by providing financial support, health insurance, and safeguarding the security of a site before starting to plan an away elective. We also offer GHE experiences in other resource-limited settings, such as clinics in the Indian Health System that do not necessitate international travel.

In contrast to the increasing interest of US residents in GHE, many residency programs in the country have not kept pace with the demand, and several of barriers to pursuing GHE remain unaddressed. In their nationwide survey of graduating pediatric residents, Anspacher et al found that only 59.2% of the respondents reported any GHE offered in their programs (Anspacher et al., 2011). Moreover, fewer than half of the respondents received training in the topic areas considered essential to GHE. Of the respondents who expressed an interest in pursuing GHE activities in their careers, the exposure to these topics was sub-optimal, varying from 25% to 58%. In a survey of GHE programs across the country, Liaw et al found that only 50% of program funding was supported by the parent institution, and only about 26% of the responding programs expected their funding to increase (Liaw et al., 2014). Fortunately, many institutions have begun to address this issue by implementing formal GHE curricula and partnering with the host-site institution for the same (Butteris et al., 2015). A GHE track in residency helps to alleviate the concerns of under-staffing of the program at home while the residents are at the away site. Our study aims to bring light to the burgeoning interest in GHE in order to help raise awareness and promote the cause of funding these programs. However, the need for constant evaluation and advances of all these factors is critical to successful implementation (Howard, Gladding, Kiguli, Andrews, & John, 2011; Suchdev et al.).

Our study was limited in its scope in that it surveyed only the residents of one residency program in the United States. However, it is a large institution attracting applicants from a broad catchment area. The survey was conducted a few months after the match process and may suffer from recall bias. There may be a theoretical ‘expectation pressure’ on respondents to demonstrate ‘interest’ in GHE. However the surveys were anonymous and voluntary, and all returned questionnaires including incomplete ones were included in the analysis. Our program has
a strong GHE curriculum and hence our study may suffer from selection bias. It also offers a dedicated GHE elective which is a part of the residency training schedule, hence the availability of dedicated elective time was not included as a possible ‘barrier’ in our questionnaire. A broader survey across different regions and institutions in the developed world may yield valuable additional information on the interest in GHE, as well as the barriers to its pursuit. A knowledge-attitude-belief study would elucidate the residents’ more detailed perceptions of GHE. Additionally, it would also be illuminating to conduct a post-residency survey to assess how many of the residents interested in GHE were actually able to pursue the curriculum and participate in the opportunities offered.

Conclusion

We found an increasing trend of prior experience in GHE before residency, and significant impact of GHE on residency and future career choices, alongwith consistently significant numbers of residents expressing an interest in GHE. The strong trends emerging from our center are significant. The increasing exposure of students to GHE in college and medical school, greater connectivity, and faster travel will facilitate GHE interest in the future; thus, prior experience associated with greater desire for GHE is possibly an indicator for the future. Further, most leading pediatric centers in the developed world serve populations that are socially and economically vulnerable; hence the applicability of GHE principles and practices is increasingly imperative. The onus is now on academic centers to set the pace for smaller programs by establishing cooperative and comprehensive GHE programs, truly embodying the definition of global health. As we look ahead into the future, it is important that these programs are developed with the residents' needs in mind in conjunction with a foundation of understanding and compassion for the populations served.

Take Home Messages

- A significant majority of pediatrics residents are interested in global health education and use it as a factor for ranking programs
- The significant interest in global health indicates the need for an organised dedicated global health education curriculum
- The critical barriers for pursuit of global health education are - financial support, personal safety and mentorship at site of global health experience

Notes On Contributors

Kriti Puri is a pediatric cardiology fellow at Texas Children’s Hospital. Her areas of interest include global health, international cardiology and critical care.

Jonathan Castillo is a developmental pediatrician, currently a faculty member in the Meyer Center for Developmental Pediatrics at Texas Children’s Hospital. His areas of research interest include the development, implementation, and evaluation of educational programs related to trainee education in global health and disparities issues, spina bifida, fetal interventions impacting neurodevelopment, and global health education.

Heidi Castillo is a developmental pediatrician, currently a faculty member in the Meyer Center for Developmental Pediatrics at Texas Children’s Hospital. Her areas of interest include spina bifida, cerebral palsy, infant/toddler
 development and healthcare in Central America. She currently leads the TCH site of a Centers for Disease Control and Prevention research project in collaboration with fourteen other Spina Bifida programs throughout the United States.

Jareen Meinzen-Derr is a quantitative epidemiologist with a joint appointment between the Divisions of Biostatistics and Epidemiology and Pediatric Otolaryngology at Cincinnati Children's Hospital Medical Center. She also teaches courses as part of the Clinical Research Training Program at the University of Cincinnati, Department of Environmental Health, and supports the educational curricula for fellow research education within the Divisions of Neonatology, Developmental and Behavioral Pediatrics, and Pediatric Otolaryngology.

Charles Scubert is a professor of clinical pediatrics in the Division of Pediatric Emergency Medicine at Cincinnati Children's Hospital Medical Center. He has always had an interest in delivering quality medical care to patients living in poverty both in this country and in Africa. He was one of the founders of Crossroad Health Center, a community health center in one of Cincinnati's poorest communities. As associate program director for the Pediatric Residency Program, he is developing the Global Health Track for pediatric residents.

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Appendices

Declarations

The author has declared that there are no conflicts of interest.

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