



# The Association Between Global Health Training and Underserved Care: Early Findings From Two Longstanding Tracks

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**BACKGROUND AND OBJECTIVES:** Global health tracks (GHTs) improve knowledge and skills, but their impact on career plans is unclear. The objective of this analysis was to determine whether GHT participants are more likely to practice in underserved areas than nonparticipants.

**METHODS:** In this retrospective cohort study, using the 2009 American Medical Association Masterfile, we assessed the practice location of the 480 graduates from 1980–2008 of two family medicine residencies—Residency 1 and Residency 2. The outcomes of interest were the percentage of graduates in health professional shortage areas (HPSAs), medically underserved areas (MUAs), rural areas, areas of dense poverty, or any area of underservice.

**RESULTS:** Thirty-seven percent of Residency 1 participants and 20% of nonparticipants practiced in HPSAs; 69% of Residency 2 participants and 55.5% of nonparticipants practiced in areas of dense poverty. All other combined and within-residency differences were not statistically significant.

**CONCLUSIONS:** These findings neither confirm nor refute the results of prior surveys suggesting that global health training is associated with increased interest in underserved care. Studies involving more GHTs and complimentary methods are needed to more precisely elucidate the impact of this training.

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Family medicine educators are increasing opportunities for global health training to broaden their community medicine curricula, address service learning, and recruit medical students who are seeking out educational experiences in global settings.<sup>1-4</sup> In 1999, 18.2% of graduating medical students took part in international health experiences while that figure increased to 30.8% in 2010.<sup>5-6</sup>

Prior research has demonstrated that such experiences foster idealism, enhance physical exam skills, and increase tropical disease knowledge.<sup>7</sup> However, few studies have examined the impact of global health experiences on career paths. The existing literature suggests that participants have increased interest in primary care, are more likely to treat those receiving public assistance, and are more likely to

report caring for underserved populations.<sup>8-10</sup> While informative, these studies rely on surveys. Others in global health education research have called for measurements other than self-reported data that would examine where global health participants are ultimately practicing.<sup>11</sup>

There are several possible mechanisms that could explain an association between underserved care and exposure to global health experiences: (1) The global health experience does not change the career path. These trainees make mission-driven decisions regarding career paths and have a strong preference for caring for the underserved both domestically and internationally. They would work in underserved areas regardless of whether or not they had the global health experience. (2) The global health experience reinforces the career path. These trainees are interested in underserved work but do not have a strong preference for practicing in an underserved setting. The global health experience may reinforce or reinvigorate their interest in underserved work. (3) The global health

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experience alters the career path. These trainees had no interest in underserved work, but their exposure to service learning created a desire to work with the underserved. (4) Other factors such as wanting to be close to family, loan repayment incentives, or needing to work in a certain area due to a spouse's job influenced the decision to work in an underserved area. The trainee's exposure to a global health experience was merely coincidental. In addition to these attitudinal factors, global health experiences can provide trainees with the skills necessary to succeed in underserved settings. Participants of global health experiences frequently work in settings with limited access to technology and specialists and care for patients that are impoverished and culturally diverse. Unfortunately, the association between underserved care and exposure to global health experiences has never been demonstrated using non-survey-based methods. Prior to exploring which mechanism is most predominant, the existence of an association should first be established.

Policy makers and educators have long sought to address access issues related to physician maldistribution.<sup>12,13</sup> This problem could be exacerbated by the Patient Protection and Affordable Care Act if physicians in shortage areas are unable to accommodate the newly insured as was seen initially following health care reform in Massachusetts.<sup>14,15</sup> Global health tracks (GHTs) during family medicine residency expose trainees to underserved medicine where they

can acquire the skills needed to care for culturally diverse populations in resource-poor settings. The World Health Organization has promoted the accountability of all medical training institutions to the communities they serve, and in particular to those specialties, populations, and areas in greatest need of service.<sup>13</sup> Novel indices and online measures of social accountability have now been created for medical schools, including rankings according to their ability to produce physicians for shortage areas, and similar metrics for graduate medical education programs will soon follow.<sup>16,17</sup>

The objective of this analysis was to determine whether participation in GHTs during family medicine residency was associated with practice in geographies of underservice (such as health professional shortage areas [HPSAs] and medically underserved areas [MUAs]). This analysis furthers the existing research on global health education by examining for the first time non-self-report outcome measures regarding career paths following these experiences. We sought to determine whether the increased interest in underserved care that the global health participants in prior surveys reported actually translates into practice in those areas.

## Methods

In this multi-site, retrospective cohort analysis, we attempted to understand the association of GHT participation and practice in underserved geographies. Our sample

consisted of the 489 graduates from 1980–2008 of two family medicine residencies with perhaps the longest and most well established GHTs—hereafter Residency 1 and Residency 2. Both residencies have well-delineated track components and opportunities for international electives (Table 1). Residency 1 also has wilderness and rural tracks. These residents were excluded from the sample since the exposures, knowledge, and skills they acquired through those tracks would also prepare them for caring for the underserved. Further, the wilderness track participants are required to complete field training, which often takes place in international settings. We also excluded graduates that could not be matched in the AMA Masterfile or lacked an address that could be linked to geographic coordinates. The exposure of interest was participation in a GHT.

We chose outcome measures that would have policy implications such as work in high need areas and community health centers. The outcomes of interest were the percentage of GHT participants and nonparticipants practicing in (1) HPSAs, (2) MUAs, (3) rural areas, (4) areas of dense poverty (defined as census tracts with greater than 20% of households earning less than 200% of the federal poverty level), and (5) any of the above.<sup>18</sup> To obtain these figures, we divided the number of graduates stratified by GHT participation working in these geographies by the total number of GHT participants and nonparticipants. The null hypothesis was that there would be

**Table 1: Comparison of the Components of the Global Health Tracks in Residencies 1 and 2**

	Residency 1	Residency 2
First year of the global health track	1985	1994
Didactics	<ul style="list-style-type: none"> <li>• Monthly global health meetings</li> <li>• One global health conference</li> <li>• 1-month tropical medicine course</li> </ul>	<ul style="list-style-type: none"> <li>• Lectures and discussions during monthly conferences</li> <li>• Courses prior to international brigades</li> <li>• Quarterly book discussions</li> </ul>
Duration of international experiences	PGY-1: 4 weeks PGY-2: Up to 8 weeks	PGY-1: 9 days PGY-2: 2–3 weeks PGY-3: 4 weeks (optional)

no difference between the two groups in terms of the percentages working in these underserved geographies.

We used the 2009 AMA Masterfile to determine practice locations. The Masterfile contains current and historical data for more than one million physicians in the United States (including non-AMA members). Data fields within the Masterfile include residency, practice type, and primary practice location. Using Geographic Information System (ArcGIS 9.3.1), we referenced physician practice location to federally designated shortage and underserved geography information from the Health Resources and Services Administration (HRSA) Geospatial Data Warehouse. HPSAs are designated by HRSA as meeting specific population to primary care physician (PCP) thresholds.<sup>19</sup> Several federal programs such as the National Health Service Corps and Medicare use HPSA designations to determine which physicians

are eligible for incentive payments. HRSA also designates MUAs by taking into account four variables: the ratio of PCPs per 1,000 population, infant mortality, percentage of the population earning less than the federal poverty level, and percentage of the population aged 65 and older.<sup>20</sup> Rural areas were defined as practice in non-Metropolitan Statistical Areas (MSAs) (areas with populations less than 50,000). We obtained poverty information from Census 2000, Summary File 3. Unlike HPSAs, areas containing dense poverty are not linked to federal bonus or incentive payments; however, this area-based measure has been used to determine which geographies are plagued by economic deprivation and disadvantage.<sup>18</sup> Chi-square tests for measures of association were computed using SAS (v9.2, SAS Institute, Cary, NC).  $P < .05$  was considered to indicate statistical significance. This analysis was approved by the Institutional

Review Board of the American Academy of Family Physicians.

## Results

A total of 489 residents from Residency 1 and Residency 2 graduated between 1980 and 2008 (Tables 2 and 3). Of the 193 graduates from Residency 1, 16% completed the GHT while 29% of the 296 graduates from Residency 2 completed the GHT.

Among Residency 1 graduates, 36.7% of GHT participants worked in HPSAs compared to 20.1% nonparticipants, representing an 83% increase ( $P = .03$ ). However, GHT participants were not more likely than nonparticipants to work in MUAs, rural areas, or areas of dense poverty (Figure 1).

Among Residency 2 graduates, 69% of GHT participants worked in areas of dense poverty compared to 55% nonparticipants, representing a 24% increase ( $P = .03$ ). However, GHT participants were not more likely than nonparticipants to work in HPSAs, MUAs, or rural areas (Figure 2).

When combining the GHT participants and nonparticipants from the two residency programs, there were no statistically significant differences in terms of practice in the policy-relevant geographies of underservice (Figure 3).

## Discussion

Understanding how existing innovations in graduate medical education impact the underserved workforce is of considerable interest, particularly for promising programs with limited supporting evidence such as global health education.<sup>8,9</sup>

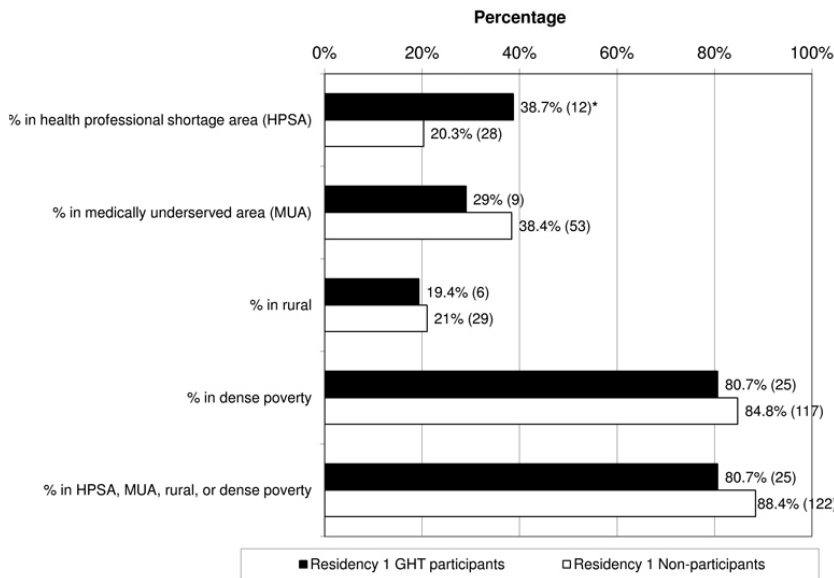
**Table 2: 1980–2008 Family Medicine Residency Graduates From Residency 1 and Residency 2, by Track Participation**

Track Participation	Number of Graduates (% of Total per School)
<b>Residency 1</b>	
Global health	31 (16%)
Rural	9 (5%)
Wilderness medicine	7 (4%)
No track participation	146 (75%)
<b>Residency 1 Total</b>	<b>193</b>
<b>Residency 2</b>	
Global health	87 (29%)
No track participation	209 (71%)
<b>Residency 2 Total</b>	<b>296</b>
<b>Total (1 and 2)</b>	<b>489</b>

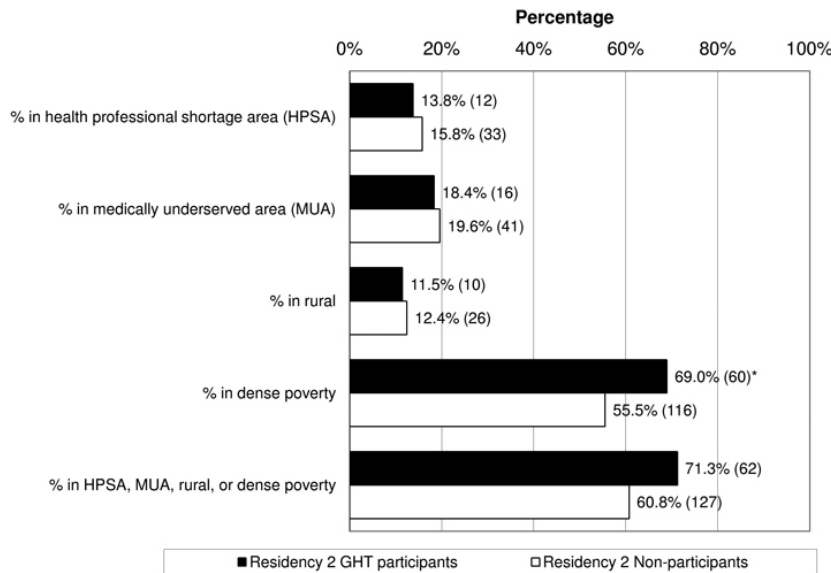
**Table 3: Demographic Data on Participants and Nonparticipants**

Residency	Global Health Track Participation	Age at Residency Graduation (Mean)	Male (%)	International Medical Graduate (%)
Residency 1	Participants	31.3	19 (63.3)	1 (3.3)
	Nonparticipants	33.4	85 (61.6)	5 (3.6)
Residency 2	Participants	31.6	41 (47.1)	6 (6.9)
	Nonparticipants	32.4	123 (58.6)	23 (11)

**Figure 1: Percentage of Residency 1 Graduates in Underserved Areas, by Global Health Track Participation**



**Figure 2: Percentage of Residency 2 Graduates in Underserved Areas, by Global Health Track**



Our findings, albeit limited by small sample size and potential confounding exposures, nonetheless reveal some interesting trends. Residency 1 GHT participants were nearly twice as likely as nonparticipants to practice in HPSAs, and Residency 2 GHT participants were more likely than nonparticipants to practice in areas of dense poverty. These

differences were not statistically significant when the participants from the two institutions were combined.

Our findings provide a unique perspective on the discussion of whether or not global health training affects career paths. Previously restricted to conclusions drawn from survey responses, our paper advances the literature since this is the first time

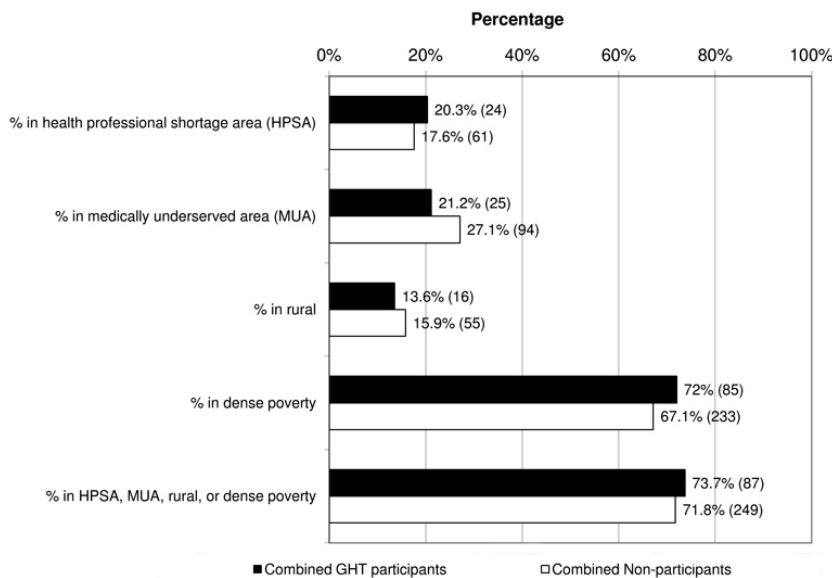
an analysis has sought to determine whether GHT participants ultimately practice in underserved areas. However, these data call into question whether an association between GHT participation and underserved work actually exists and suggest that the effect of global health training on career path is subtle enough that more sophisticated analyses involving larger samples are needed to elucidate the exact relationship.

These data should be interpreted with caution, and several limitations should be taken into account. First, our outcome measure only accounts for domestic underserved care. Since these GHTs train graduates to work in global settings, some may spend significant time in underserved settings abroad. Unfortunately, this type of underserved care is not captured by the AMA Masterfile. Second, our analysis only evaluated where graduates practiced in 2009. Those who worked in underserved settings before 2009 will be missed. Third, alternative comparison groups may be more revealing. The implementation of the GHT could have had benefits to participants and nonparticipants alike, increasing the likelihood that all graduates will practice in underserved areas. Comparing programs with GHTs to matched controls without GHTs may reveal more substantial findings. Fourth, our sample may be prohibitively small. Adding more residencies and GHT participants to our sample would allow us to detect smaller differences.

To fully determine whether an association exists, we plan to evaluate these outcome measures over longer time frames prospectively, to capture graduates that practiced in underserved geographies before 2009. Additional survey-based assessment of other socially desirable practice locations, such as those graduates working in homeless clinics or international settings would also provide a more complete picture of where graduates are practicing now. Finally, with enough funding and collaboration of several data-holding institutions, richer predictive models



**Figure 3: Percentage of Residency 1 and Residency 2 Graduates in Underserved Areas, by Global Health Track Participation**



could include other known predictors and confounders of eventual underserved care such as rural birth, exposure to Title VII funding, and minority race.<sup>21</sup>

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