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The Correlation between Global Health Experiences in Low-Income Countries on Choice of Primary Care Residencies for Graduates of an Urban US Medical School

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ABSTRACT *This study sought to determine whether medical students who participate in a global health elective in a low-income country select residencies in primary care at higher rates compared with their classmates and US medical graduates in general. Given the projected increase in demand for primary care physicians, particularly in underserved areas, understanding possible factors that encourage training in primary care or enhance interest in the care of underserved populations may identify opportunities in medical school training. The authors used data from the Office of Student Affairs, SUNY Downstate College of Medicine and the National Residency Matching Program to compare rates of primary care residency selection from 2004 to 2012. Residency selections for students who participated in the SUNY Downstate School of Public Health Global Health Elective were compared with those of their classmates and with residency match data for US seniors. In 7 of the 8 years reviewed, students who participated in the SUNY Downstate School of Public Health Global Health Elective selected primary care residencies at rates higher than their classmates. Across years, 57 % of the students who completed the elective matched to primary care residences, which was significantly higher than the 44 % for the remainder of Downstate's medical student class ($p=0.0023$). In 6 of the 8 years, Downstate students who participated in the Global Health Elective selected primary care residencies at rates higher than US medical school seniors in general; rates were the same for both Downstate Global Health Elective students and US medical school seniors in 2009. Students who participated in a global health experience in a low-income country selected primary care residencies at higher rates than their classmates and US medical school graduates in general. Understanding how these experiences correlate with residency selection requires further investigation; areas of future study are discussed.*

KEYWORDS *Medical school graduates, Primary care residency choice, Urban medical school graduates, Global health electives for medical students, Global health experience in low-income countries, Underserved populations, Residency selections, Factors influencing medical residency choice, Primary care residencies*

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INTRODUCTION

The School of Public Health at the State University of New York, Downstate Medical Center (previously the Department of Preventive Medicine and Community Health at the State University of New York, Downstate Medical Center) has sponsored a 6–8-week Global Health Elective in low-income countries for fourth-year medical students since 1980. As of 2012, 343 medical students, out of approximately 6,400, have participated in this elective in 40 countries. The elective includes academic, service, and cultural objectives. Students who complete this elective develop an understanding of the health care delivery system of the host country, including the cultural context of health as it relates to the general population and gain insight into the social and economic determinants of disease. In addition, students provide public health or primary care service.[1] The enduring interest in this global health elective parallels an expanding interest in global health in medical schools throughout the USA and the importance of global health education.[2–4] As of 2012, 30 % of graduating seniors from US medical schools had participated in a global health experience.[5]

Global health has been defined as an area of study, research, and practice that prioritizes health improvement and the achievement of equity in health for all people.[6] The benefits of international experiences in medical school have been widely reported in the literature with outcomes including a career choice in primary care or public health-related practice, and improved cultural awareness and sensitivity. One survey of physicians 4–7 years after participating in an international health experience as senior medical students concluded that those students were more likely to practice primary care or obtain a Master of Public Health (MPH) degree compared with US physicians in general.[7] A survey of preclinical medical students, after an experience in rural Nicaragua, demonstrated positive effects on the students including an increased interest in volunteerism, humanitarian efforts, work with underserved populations, and more compassion toward the underserved.[8]

A survey of medical students in a small program who completed 8-week rotations in resource-poor countries found that 70 % of the students who completed these rotations entered primary care careers, suggesting at least a reinforcing effect of the elective.[9] Several students also stated that the experience would have a permanent, beneficial effect on their professional careers.[9] Evaluation of a 6–8-week international field experience for senior medical students 1 to 2 years after the field experience reported improved skills in working with the underserved and increased participation in community activities to improve health.[10] In this study, the greatest influence the international experience had on clinical skills was on consideration of cultural factors in patient care, awareness of the socioeconomic factors in health care, and improved communication with patients from a variety of backgrounds.[10]

These positive effects become even more significant with studies reporting that medical students experience a change in their attitudes, including a tempering or elimination of the idealism that stimulated their initial career interest as they progress through medical school.[8,11,12] These changes in attitude occur during both preclinical and clinical years and likely affect how a physician will practice medicine.[12] Residency programs have also documented the influence of international rotations on career paths. Three studies describe a reinforcement of the values of participants and the influence of the experience on decisions and attitudes, including increased care of underserved populations as well as changes in career plans to move toward general internal medicine or public health.[13–15]

While interest in global health increases, the implementation of the Affordable Care Act creates an increased demand for physicians, especially those in primary care. In 2006, a projected physician shortage led to recommendations to increase enrollment in medical schools, establish new medical schools, and increase the number of new residency positions.[16,17] Despite these efforts, it is estimated that by 2020, there will be a shortage of 91,500 physicians.[17]

Primary care physicians play a critical role in the health care system, and with many medical students selecting specialty practice over primary care, any shortage in physicians will directly affect the quality of the health care system. In addition, it is anticipated that these physician shortages will most likely affect underserved populations at the same time that reduced access across specialties will have a negative impact on overall healthcare delivery.[17]

We sought to determine whether medical students who have the opportunity to participate in the SUNY Downstate School of Public Health's global health experience selected primary care residency training at rates higher than nonparticipating classmates. Although the global health experience occurs after residency selection is made, understanding factors that may advance medical students' commitment to primary care or care of underserved populations could potentially inform medical school curricula. This retrospective study compared the rates of primary care residency selections of students who were selected to participate in a clinical global health elective at SUNY Downstate over an 8-year period, from 2004 to 2012, to those of their corresponding classmates. Data on residency selection prior to 2004 are incomplete. Rates of primary care residency selections were also compared to the National Residency Matching Program results of seniors in US medical schools over the same time frame. A correlation between residency selection and participation in an international elective could identify potential opportunities to encourage training in primary care.

METHODS

Participation in the SUNY Downstate Global Health Elective requires that medical students submit applications to the School of Public Health by December 31st of their third year of medical school. The co-directors of the elective review all applications and medical school transcripts; competitive applicants are interviewed by a member of the Global Health Elective Selection Committee. Students are notified of acceptance to the elective by early spring of the same year. Given the timing of the application deadline, many students have completed approximately 50 % of their clinical rotations, and many remain uncertain of their residency choice at the time of their elective interview. Of note, those students who have a MPH degree or are in the process of obtaining an MPH degree are given priority to participate; however, acceptance is not guaranteed.

Since the number of students applying for admission to this elective exceeds the available slots, competition is generally high, and acceptance rates range from a low of 32 % in 2008 to 74 % in 2011 over this 8-year period. Most students were assigned to one of our long-standing sites overseas with the remaining students arranging an independent site with approval from the course directors. Independent sites arranged during the 2004–2012 period included Bangladesh, Barbados, Brazil, Ecuador, Egypt, Ghana, Guinea, Jamaica, Malawi, Nigeria, Panama, Peru, South Africa, Taiwan, Tanzania, Tibet, and Vietnam. Once sites have been assigned, each student meets individually with the co-directors for in-depth health advisement,

including a review of immunization status and recommendations for immunizations needed and malaria prophylaxis. The health status and current medication use of each student are also carefully reviewed. In addition, information regarding local culture and customs, appropriate attire, housing, local travel, and safety are also provided.

National Residency Matching Program data were obtained for the three comparison groups. These three groups were Downstate senior medical students who participated in the Global Health Elective, Downstate senior medical students who did not participate in the elective, and US medical school seniors. The comparative data covered the years 2004–2012 and were obtained from the SUNY Downstate Office of Student Affairs and the National Residency Matching Program.

The residency match results for 1,696 Downstate medical students over 8 years were reviewed to determine trends in residency selection over this period. These rates were also compared to rates of primary care residency matches for all US medical school seniors. The association between participation in the Global Health Elective and likelihood of primary care residency among the Downstate senior medical students was assessed by a chi-square test. Primary care residencies included family practice, internal medicine, general pediatrics, medicine–pediatrics, and obstetrics–gynecology.

RESULTS

From 2004 through 2012, a total of 164 students participated in Downstate's Global Health Elective. Across years, 57 % of the students who completed the elective matched to primary care residences (Table 1) which was significantly higher than the 44 % for the remainder of Downstate's medical student class ($p = 0.0023$) (Table 2). In all but one of the 8 years, 2005, students who participated in the Global Health Elective selected residencies in primary care at a higher rate than their classmates.

The rate of primary care residency selection for Downstate students who participated in the Global Health Elective was compared to the rates of primary care residency selection for seniors from US medical schools by year (Table 3).[18,19] In 6 of the 8 years, students who participated in the elective were more likely to select a primary care residency. In 2005, the rate of primary care selection was

TABLE 1 Primary care residency selection by Global Health Elective students by year, SUNY Downstate College of Medicine

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Family Medicine	0	0	1	0	2	0	2	1	2
Internal Medicine	2	3	8	3	4	4	7	5	5
Medicine–Pediatrics	0	0	0	1	0	0	0	0	0
Obstetrics–Gynecology	2	3	3	2	0	3	2	1	1
Pediatrics	5	2	4	4	3	2	3	2	1
Total # of students in primary care	9	8	16	10	9	9	14	9	9
Total # of students in elective	16	20	23	17	14	20	21	14	19
% Primary care	56	40	70	59	64	45	67	64	47

TABLE 2 Primary care residency match by year, 2004–2012, exclusive of Global Health Elective students, SUNY Downstate College of Medicine

Residency match	2004	2005	2006	2007	2008	2009	2010	2011	2012
Family Medicine	4	4	4	4	3	2	2	7	5
Internal Medicine	46	45	42	45	48	43	40	46	40
Medicine–Pediatrics	1	3	0	2	0	0	1	0	0
Obstetrics–Gynecology	3	7	3	5	9	3	4	11	13
Pediatrics	30	18	23	19	24	14	16	25	14
Total # of students matched to primary care	84	77	72	75	84	62	63	89	72
Total # of students in class	166	172	173	162	182	172	150	180	175
% Primary care	50	45	42	46	46	36	42	49	41

higher for US seniors. In 2009, both Downstate Global Health Elective students and US seniors had the same rate of primary care residency selection (Table 4).

DISCUSSION

For medical students, career choice and practice setting are determined by a multitude of personal and professional considerations. Many medical students initially pursue a career in medicine because of idealistic goals and a basic desire to help others. In the past, there have been calls for medical education to promote these values of altruism and service in future doctors by exposing students to settings with great need, such as the health care needs of a resource poor country.[20] As the immigrant population in the USA continues to rise, future physicians should be exposed to experiences that promote an understanding of the relationship between culture and health. They should also be prepared to provide culturally competent care, while mastering knowledge of an expanding spectrum of disease.[4] The benefits of a clinical global health experience for medical students, specifically in low-income countries, have been described in prior studies and include, among others, a greater likelihood of entering general primary care, a greater likelihood of engaging in community service, and a desire to practice medicine among underserved and multicultural populations.[1,3,7,8,10,21–23]

Downstate's Global Health Elective began in 1980 and, since its inception, has provided 343 students with primary care, public health, preventive medicine experiences in low-income countries. The underlying reasons for student participation in this elective have not been statistically assessed. Other programs report that students may be motivated to pursue international health experiences to fill perceived gaps in their education such as a lack of exposure to the idea of service, to develop cultural awareness and understanding, or to reinforce altruistic ideals.[7,20] Our participants have consistently cited a desire to provide service in low-income countries, have a cross-cultural experience, participate in a health care system different from that in the USA, and continue to reinforce altruistic goals often previously strengthened by overseas experience in low-income countries while undergraduates. In fact, many of our elective participants have previously traveled to low-income countries, and many have participated in these countries in well-organized educational or service programs. Others have served in the Peace Corps in low-income countries. Thus, a large number of our participants have had previous meaningful experiences in low-income countries. On

TABLE 3 National Residency Matching Program results for primary care residencies, by year, 2004–2012

Residency match	2004	2005	2006	2007	2008	2009	2010	2011	2012
Family Medicine	1,185	1,117	1,123	1,096	1,156	1,071	1,169	1,301	1,322
Internal Medicine	2,602	2,659	2,668	2,680	2,660	2,632	2,722	2,940	2,941
Medicine–Pediatrics	296	275	294	275	248	241	299	309	276
Obstetrics–Gynecology	743	772	835	837	838	879	915	893	913
Pediatrics	1,611	1,679	1,668	1,694	1,610	1,682	1,711	1,768	1,732
Total # of students matched to primary care	6,437	6,502	6,588	6,582	6,512	6,505	6,816	7,211	7,184
Total # of matched US seniors	13,572	13,798	14,059	14,201	14,359	14,566	14,992	15,588	15,712
National % primary care totals	47	47	47	46	45	45	45	46	46

Source[18,19]

TABLE 4 A comparison of the percent of SUNY Downstate College of Medicine students and national US seniors selecting residencies in primary care

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Global Health Elective Students	56	40	70	59	64	45	67	64	47
Downstate students exclusive of GHE students	50	45	42	46	46	36	42	49	41
National US seniors	47	47	47	46	45	45	45	46	46

debriefings, following their overseas experiences, our students consistently report that their Global Health Elective was their best medical school experience.

We recognize that students who express interest in our elective may be interested in primary care independently of overseas opportunities. However, given the reported changes in attitudes as medical students advance through the medical school curriculum, we tried to determine whether students who participate in this elective enter primary care specialties at rates higher than those who do not. Our review demonstrated that, over the course of this 8-year period, students who participated in the elective were more likely to match in a primary care residency at rates higher than their classmates and at rates higher than the corresponding medical school seniors who participated in the National Residency Matching Program. Given the fact that more students who participated in the elective chose primary care, it is important to consider the factors that contributed to this decision.

The timing of the SUNY Downstate elective in the fourth year of medical school precludes any discussion of causality or direct effect since residency selection is completed before the time of travel. An area of future study could follow students through their 4 years of medical school and monitor prospective career considerations and general attitudes at distinct milestones over the course of their medical education. Such a study could include additional data collection around the time of the application for the overseas elective. In addition, both survey and in-depth interviews with graduates who participate in the Global Health Elective would be helpful in order to obtain insights into factors that guide their career decisions and also determine any lasting impressions or effects of the overseas experience. It also should be noted that although there is a tendency to measure the success of an international elective by a career choice in primary care, a better measure might include types of subsequent activities, such as service to community or commitment to action, not just specialty choice.[24]

There are several limitations to this study. Since students with an MPH or primary care focus, if known at the time of application/interview, are given priority for acceptance, a selection bias may occur. However, we do not have a large number of MD/MPH students, averaging approximately five students out of a class of 200. Of these five, two MD/MPH students per year might participate in the elective. In addition, the number of applications varies from year to year and may be affected by outside factors. These include world events and security concerns that can affect the number of applications and ultimately the outcomes. Another limitation of this study is that long-term data regarding career path or practice patterns for students completing this elective have not yet been collected. Extrapolating information to national numbers is difficult since the percentage of students who participated in a global health elective in a low-income country nationally is unknown as is the percentage of those specific students who chose a primary care residency.

Approximately 30 % of medical students participate in what are termed global health or international health electives. However, what is not known is the proportion of these that occur in income-poor countries, as is the case with our elective. It is probable, based on anecdotal information, that a significant proportion of these electives take place in Europe or other income-rich countries. Whether or not this type of experience influences choice of residency is unknown. What is also unknown is the influence of timing of these experiences on future career choice. Students in the early years of medical school sometimes participate in either formal or informal international experiences either during vacation breaks or summer vacations. These experiences are very diverse and may consist of nothing more than "medical tourism" or else include formal course work in tropical diseases and public health, and hands-on community-based preventive service delivery. Earlier global health experiences in medical school may either induce students to pursue this option later on or to avoid it. For others, the experience may be neutral.

Another factor influencing medical student decision to participate in a global health elective is cost and overseas location. The SUNY Downstate Global Health Elective places students in overseas sites and currently provides them with a $2,500 stipend to help defray travel and other costs. These stipends have been funded with support from the Alumni Fund of the Downstate College of Medicine and private foundations. Without these significant supports, many of our students, who come from low- and modest-income families, would be unable to participate in such an experience.

Given the growing interest and reported benefits of global health experiences, a greater understanding about the students who seek these experiences and the reasons for doing so may help identify opportunities in the medical school education experience that would encourage interest in primary care and care for the underserved population.

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