Evaluation of the UCLA Department of Medicine Malawi Global Health Clinical Elective: Lessons from the First Five Years

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Abstract. In 2008, the UCLA Department of Medicine established a three-week clinical elective in Malawi, Africa, for Medicine and Medicine/Pediatrics residents. We sought to determine whether the elective resulted in improved medical knowledge, alterations in career trajectory, and whether the opportunity for the elective influenced selection of UCLA for residency. A 29-question survey was distributed to all graduates of the elective from 2009–2013. Surveys were distributed to 40 individuals, with 33 responses (82.5%). Thirty-one participants (93.9%) reported increased medical knowledge and 24 participants (72.7%) reported the rotation altered their career trajectory. Among the 23 residents who came to UCLA after the elective was established, 13 (56.5%) stated it had an influential role in their selection of UCLA for residency. The Malawi elective resulted in self-reported increases in medical knowledge, alterations in career trajectory, and has played an important role in attracting individuals to UCLA for residency.

INTRODUCTION

Clinical global health electives are an increasingly important aspect of residency training. In the postgraduate years, global electives provide residents with opportunities for learning through immersion in settings with different diseases and in systems with limited resources compared with the typical United States training environment. Previous studies of postgraduate global health electives have explored why participants seek out these experiences, their influence on selection of residency programs, how electives change perspectives on healthcare delivery, and how they influence the types of medical practices participants pursue afterwards.^{1–6}

Despite previous research, gaps remain in our knowledge of how to best implement global health electives, how these experiences contribute to postgraduate medical education, and the extent to which they alter elements of future medical practice and/or career trajectory. We sought to add to the body of literature on postgraduate clinical global health work through a program evaluation of a new University of California at Los Angeles (UCLA) Department of Medicine elective in Malawi, Africa. In addition to understanding strengths and weaknesses of the program through a rigorous evaluation, our objectives were to determine characteristics of those who participated and whether participation in the elective resulted in improved knowledge, changes in practice of medicine in relation to use of resources, and alteration in career trajectory. We also wished to explore whether the availability of the Malawi elective influenced selection of UCLA for residency among program participants.

UCLA Clinical Elective in Malawi. The Malawi elective was established in 2008 and consists of a three-week experience at Partners in Hope Medical Center in Lilongwe, Malawi. The elective is open to senior UCLA Internal Medicine (third year) or third or fourth year Medicine/Pediatrics (Med/Peds) residents. Although there is a formal application process for the Malawi elective, thus far all interested applicants have been accommodated (up to 12 per year). The elec-

tive is overseen by a full-time UCLA non-clinician Program Director who lives in Malawi and by a Los Angeles-based UCLA faculty member. Expenses are covered by the UCLA Department of Medicine, including airfare, housing, and in-country transportation. Medical insurance, including evacuation coverage, is provided through UCLA. United States-trained Family Medicine and Internal Medicine physicians based in Malawi precept visiting UCLA residents, and for a select number of electives each year, additional UCLA Infectious Diseases faculty travel with residents to provide supervision. One of the main goals of the elective has been to use the UCLA visiting teams for training of Malawian clinicians, and as such, residents work alongside Malawian clinical officers and nurses and when possible are paired with Malawian medical students or clinical officer trainees.

Before departure, all residents are required to see a travel medicine specialist to obtain appropriate vaccines, malaria prophylaxis, antibiotics, and human immunodeficiency virus (HIV) post-exposure prophylaxis. All residents also participate in a two-hour orientation at UCLA, consisting of lectures on Malawi's history and culture, an introduction to Partners in Hope Medical Center, elective logistics including expectations of residents while working at the clinic, and health and safety while working in Africa, including personal safety, managing traveler's diarrhea, universal precautions for procedures, and information about post-exposure prophylaxis in the event of an occupational exposure. During the orientation, residents are given a brief overview of Malawi's antiretroviral therapy (ART) guidelines, as well as an introduction to the management of common opportunistic infections, tuberculosis and malaria. The elective has an established list of goals and objectives, based on the Accreditation Council of Graduate Medical Education core competencies (Supplemental Appendix Table 1), and a detailed curriculum that is updated annually. The residents undergo an additional half-day orientation when they arrive at the clinic in Malawi, including a tour of the facility, introductions to faculty and staff, history of the UCLA-Partners in Hope relationship, and lectures on HIV, opportunistic infections, and ART in Malawi, given by physicians at the clinic.

While in Malawi, residents rotate through a 16-bed medicine ward and a large ART clinic (approximately 5,000 patients), both within Partners in Hope Medical Center. They also visit

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rural health centers and medicine wards at the local government hospital, and participate in local outreach programs run by the clinic, joining teams of Malawian nurses and clinical officers to assist with care at rural ART clinics. The most common medical diagnoses evaluated and treated during the elective include human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), tuberculosis, malaria, Kaposi's sarcoma, pneumonia, infectious diarrhea, and sepsis. Residents also manage non-communicable diseases, including hypertension, diabetes, heart disease, and chronic kidney disease. Residents perform all admissions from the outpatient ART clinic to the inpatient ward and care for these patients while on the wards, maintaining a strong continuity with patients for the duration of the elective. Residents also take an active teaching role by leading one journal club and one case presentation during the elective. Upon returning to UCLA, each resident undergoes a debriefing with the UCLA-based elective Program Director and completes an evaluation of the elective. Evaluations of resident performance are completed on paper in Malawi by supervising physicians and returned to the Program Director by residents in a sealed envelope with a signature over the envelope closure.

MATERIALS AND METHODS

The study population was derived from UCLA Internal Medicine and Med/Peds residents who have participated in the Malawi elective since it began during the 2008–2009 academic year. Rosters of the residents who participated in the elective were obtained from the Program Directors of the elective, and the residency programs provided e-mail addresses if residents agreed to future contact after graduation. After receiving approval from the UCLA Institutional Review Board, an e-mail was sent to all residents containing an informational letter, a consent form, and a link to the online survey on Survey Monkey. A 29-question anonymous survey was developed for this study (Supplemental Appendix Table 2). Questionnaire domains included demographics, current clinical practice environment, elective evaluation, challenges faced during participation, and elective impact on knowledge, practice, and career trajectory. Questions were multiple choice, with one open-ended question at the end of the survey. There were no incentives offered for completion of the survey. Non-participant data (for comparison of Malawi elective participants to non-participants) was obtained from the UCLA Medicine⁷ and Med/Peds⁸ websites and included sex and post-residency position.

Statistical analyses. Summary statistics were generated for demographic data and general evaluation responses. Associations between categorical variables, including comparing responses by residency program (Medicine versus Med/Peds), comparing participant versus non-participant career trajectories, and comparing current practice setting with global health participation post-elective were assessed by using Fisher's exact or chi-square tests. For variables measured on an ordinal scale, including comparing responses by year of elective participation and comparing importance of the Malawi elective in selection of UCLA for residency, the Spearman correlation was calculated. To evaluate other responses including change in perspective on healthcare delivery in a resource-poor setting with participant residency program, logistic regression was used. Odds ratios and confidence intervals were estimated

using logistic regression. Statistical analyses were performed by using SPSS version 22 (IBM, Armonk, NY). *P* values < 0.05 were considered statistically significant.

RESULTS

Demographic characteristics and reasons for participation in the Malawi elective. Forty-five residents completed the Malawi elective during 2008–2013. Surveys were sent to e-mail addresses for all 45 persons; 5 were not deliverable. Of 40 residents to whom emails were delivered, 33 returned surveys, yielding a response rate of 82.5%. Demographic information for respondents is summarized in Table 1. The median age at time of participation was 30.4 years (SD = 2.5 years). Of the 33 respondents, 14 (42.4%) were male and 19 (57.6%) were female; 6 (18.2%) participants were born outside the United States. Most participants were medicine residents (*n* = 24, 72.7%) and remainder were Med/Peds residents (*n* = 9, 27.3%). More than half of participants (*n* = 19, 57.6%) had global health experience before the Malawi elective, and 6 (18.2%) were still current residents at the time of the survey. Of those participants who had completed residency, 23 (85.2%) reported current practice in an urban setting, 3 (11.1%) in a rural setting, and 1 (3.7%) in both settings. In addition, of those who had completed residency, 16 (61.5%) reported their current practice included less than 25% underserved patients, and 4 (15.4%) reported more than 75% were underserved. Nine (27.3%) participants reported completing global health work after the elective (either during or after residency) and this subgroup was significantly more likely than those who did not perform further global health work to practice in a rural setting after residency (50.0% versus 0%; *P* < 0.01), and demonstrated a trend toward an increased odds of working with underserved patients in their current practice (odds ratio = 2.76, 95% confidence interval = 1.17–6.53, *P* = 0.06).

The most common reasons for participation in the Malawi elective were to learn about healthcare in a resource-poor setting (*n* = 32, 97.0%) and to gain more exposure to HIV and other tropical diseases (*n* = 31, 93.9%). Additional reasons included to improve clinical/physical exam skills (*n* = 25,

TABLE 1
Demographic information for 33 participants in the Malawi elective

Information	No. (%)
Sex	
M	14 (42)
F	19 (58)
Race†	
White	17 (52)
Black	1 (3)
Asian	14 (42)
Other	2 (6)
Country of birth	
United States	27 (82)
Other	6 (18)
Residency	
Internal Medicine	24 (73)
Medicine/Pediatrics	9 (27)
Year of residency during participation	
PGY-2*	1 (3)
PGY-3	28 (85)
PGY-4	4 (12)

* PGY = postgraduate year.

† Multiple answers could be selected.

75.8%), to improve cultural competency ($n = 19$, 57.6%), and “to learn more about whether I wanted to pursue global health in the future” ($n = 18$, 54.5%). Among the 23 residents who came to UCLA after the Malawi elective was established, 13 (56.5%) of these participants stated the elective had an influential role in their selection of UCLA for residency. From this group, those who performed global health work after the Malawi elective were significantly more likely to report that the opportunity for the elective weighed heavily in their decision to come to UCLA for residency (100% versus 29%; $P = 0.01$).

Evaluation and impact of the Malawi elective. With respect to an overall rating of the Malawi elective, 27 (81.8%) participants reported their experience was outstanding, 4 (12.1%) excellent, 2 (6.1%) good, and no one reported their experience was fair or poor. An open-ended question also yielded very positive responses about the elective (Table 2). The three most common challenges participants had during the elective were experiencing complicated patients with limited treatment options ($n = 19$, 67.9%), difficulty with communication due to language ($n = 16$, 57.1%), and experiencing death and dying due to limited resources ($n = 14$, 50.0%) (Table 3). When asked about the level of difficulty experienced adjusting to the environment in Malawi, 28 (84.8%) participants had a very easy or easy time, 5 (15.2%) had moderate problems that were easy to overcome, and no resident reported having a difficult or very difficult time. Thirty-one (93.9%) participants reported they were very likely to recommend the Malawi elective to entering UCLA residents.

Respondents' opinions on how the Malawi elective influenced their medical practice were evaluated. Most participants reported the elective increased their knowledge of tropical diseases ($n = 31$, 93.9%) and HIV/AIDS ($n = 33$, 100%). Most persons also reported improved physical examination skills ($n = 30$, 90.9%), and broadened perspective on healthcare delivery in resource-poor settings ($n = 31$, 93.9%). Twenty-eight (85%) participants believed that the elective increased their awareness of cost-effectiveness in medical prac-

TABLE 2

Selected quotations from 10 participants about their experience in the Malawi elective from an open ended question: “Is there anything else you would like to tell us or do you have any recommendations for improvement of the Malawi resident elective?”

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- “Greatest thing I did in residency (possibly in my life)”
- “My favorite rotation in residency. I learned a great deal in such a short amount of time”
- “The clinical exposure was excellent and the amount of autonomy is perfect to help foster learning”
- “It was such a worthwhile and educational opportunity”
- “I have nothing but outstanding things to say about the program. It was really an incredible experience and has really changed my perspective on medicine”
- “I really valued my time on the rotation”
- “One of the most memorable experiences I have ever had. I am looking to take some vacation time to go abroad and work in a clinic in the near future.”
- “Malawi was the most memorable month of my residency”
- “I think that it is an excellent learning experience with dedicated and intelligent physician preceptors. . .I cannot recommend the rotation highly enough”
- “I truly believe I am a better person and physician having had the opportunity to travel to Malawi and learn from such an inspirational groups of physicians”
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TABLE 3

Challenges reported during the Malawi elective ($n = 33$)*

Challenge	No. (%)
Complicated patients with limited treatment options	19 (68)
Language barrier	16 (57)
Experiencing death and dying because of limited resources	14 (50)
Disliked food/limited food options	4 (14)
Physical illness	3 (11)
Culture shock	2 (7)
Not enough supervision in clinic	1 (4)
Uncomfortable living conditions	1 (4)
Other	1 (4)
Not enough autonomy in clinic	0

*Multiple answers could be selected.

tice, and 11 (33.3%) believed that it decreased the frequency with which they use imaging to aid in diagnosis. Alteration in career trajectory as a result of the elective was common: 5 (15.2%) participants reported that the Malawi elective altered their career a significant amount, 8 (24.2%) somewhat, and 11 (33.3%) a little. For the five persons reporting significant alterations in career trajectory, additional responses indicated that the experience inspired them to perform global health as part of their career ($n = 2$), led to consideration of infectious diseases as a career path ($n = 1$), or solidified plans to pursue global health work ($n = 2$). Four participants reported that before the rotation they had planned on specialty careers, but after the rotation they pursued primary care positions. We did not collect data on whether this change was associated with specific experiences from Malawi.

We compared participants by the year they rotated in Malawi to determine whether there were temporal differences in survey responses. For each sequential year of the elective, participants were more likely to have an easier experience adjusting to the environment in Malawi ($\rho = -0.37$, $P = 0.03$), to have the elective enhance physical examination skills ($\rho = 0.47$, $P < 0.01$), and to report the experience altered their career trajectory ($\rho = 0.48$, $P < 0.01$). We also compared participants' responses by their residency program (Medicine versus Med/Peds). Med/Peds residents were significantly more likely than Medicine residents to have had global health experience before the Malawi elective (100.0% versus 41.7%; $P < 0.01$) and Medicine residents were significantly more likely than Med/Peds residents to report the elective significantly (versus somewhat or a little) changed their perspective on healthcare delivery in resource-poor settings (66.7% versus 11.1%; $P < 0.01$).

We compared post-residency positions among persons who participated versus those who did not participate in the Malawi elective and found that elective participants were more likely than their non-participant classmates to work as primary care providers or hospitalists than as specialists (53.6% versus 23.5%; $P < 0.01$).

DISCUSSION

Previous studies have shown the primary reasons for post-graduates to participate in global health programs are a desire to serve underprivileged populations⁵ and to obtain a cross-cultural experience.¹ Our survey revealed similar reasons for participation in the Malawi elective, including a desire to learn about healthcare in a resource-poor setting and to

improve cultural competency. Almost all participants in our study also sought to gain more exposure to HIV and other tropical infectious diseases. This finding is likely the result of self-selection because Malawi has an extremely high prevalence of HIV, tuberculosis, and malaria, and the elective is primarily designed and advertised to help participants gain exposure to these conditions. This finding also highlights that reasons for participation in a specific global health elective will be driven by geographic epidemiology, and electives will draw trainees desiring a particular set of experiences suited to the environment.

Findings from our study in regards to the benefits of a global health elective were similar to those in previous publications, including improvement in clinical diagnostic skills,^{2,3} a greater appreciation for the physical examination as a critical diagnostic tool,^{1,5,6} reduction in use of laboratory and/or radiologic tests,⁵ and increased knowledge of HIV and other tropical diseases.^{2,3,5} These studies, including our own, are based on participant self-report and objective measurements of elective benefits are lacking. As medical schools and post-graduate programs expand formalized global health opportunities, standardized methods to objectively measure benefits and thus offer the ability to compare experiences across sites and among different residency programs will be helpful to determine best practices for these electives.

The opportunity for participation in the Malawi elective had important collateral benefits for the UCLA Department of Medicine. Approximately 57% of those surveyed reported the availability of a structured, funded elective in Malawi played an important role in their selection of UCLA for residency. This phenomenon has been reported previously and is considered of great value in attracting top applicants to programs.²⁻⁴ When we analyzed only those participants who performed global health work after the elective, we found this subgroup was significantly more likely to report the Malawi elective weighed heavily in their decision to come to UCLA for residency. These findings draw attention to global health as an asset for residency programs and confirm there is a subset of trainees committed to global health careers for whom global electives in residency function as a critically important recruitment factor. In response to the strong interest amongst UCLA residents for global health training, in 2012–2013 the UCLA Department of Medicine launched a formal Global Health Track with a longitudinal curriculum and opportunities for two global electives during residency.

Prior studies have shown that residents who complete global health electives are more likely than those who do not to switch from subspecialty to primary care over the course of residency.^{1,3} Overall, 72.7% of residents reported an influence of the Malawi elective on their career, ranging from a little to a significant amount. We identified four participants who had plans to pursue specialties before working in Malawi and who ultimately selected primary care or hospitalist positions after residency, but we did not collect information on how the Malawi elective may have contributed to these switches. There is a need for longitudinal studies to better characterize the long-term benefits of these experiences, particularly in relation to the impact on career trajectory. These types of studies can help programs weigh costs in relation to benefits, and develop best practices for global health electives.

Although the Malawi elective was highly rated, there was a trend towards improved satisfaction scores each year the elec-

tive was offered. Specific areas highlighted as challenges by respondents in the early program years, such as adapting to the environment in Malawi, were reduced in later years; for example, 69.2% of residents in the first two years reported they found it easy or very easy to adjust versus 100% in the final two years. This data reflects the responsiveness of the program to feedback, as well as program growth over time, including the strengthening of pre-travel preparation to include more attention to sociocultural issues, a change in resident housing to increase comfort and safety, and an increase in on-site support with the addition of supervision by UCLA Infectious Diseases faculty during most of the elective months. It is therefore not surprising that those residents who rotated in the later years of the program were significantly more likely than those who rotated in the earlier years to report the elective enhanced their physical examination skills and altered their career trajectory. Our evaluation suggests that a formal mechanism for feedback is critically important to the success of global health electives and that these programs experience growing pains as they mature over time.

Our study was performed as a real-world program evaluation and was limited by the small number of participants who completed the elective during its first five years. It also lacked several important features including an assessment of baseline (pre-elective) interest in global health, a specific description for all participants about ways in which career trajectory was altered, and a formal non-participant control group. Although we were able to locate information on career choice of non-participants after completion of residency, we did not have any further information on this group to enable more detailed comparisons between post-residency practice environment and global health work. For a small number of participants who completed the Malawi elective in the first two years of the program, surveys were distributed and completed well after participation, which may have resulted in bias because of difficulty remembering the elective and its impact on knowledge, practice, and career trajectory. Finally, we did not measure the host site perspective on the Malawi elective, which is an important component of program evaluation to determine the impact, both positive and negative, of the UCLA residents and faculty on the site, in relation to training and clinical care.

In conclusion, the Malawi elective resulted in self-reported increases in medical knowledge and physical exam skills, and a greater appreciation for use of medical resources. Our data also suggests the elective had an impact on career, as reflected by the 72.7% of participants reporting some degree of alteration in trajectory after participation. The availability of the Malawi elective has also had an important role in attracting individuals to UCLA for the Medicine and Med/Peds residency programs, and inspired the development of a Global Health Track to better serve the subset of persons desiring intensive training in global health in preparation for a future career in the field. There is a need for future studies that include a baseline assessment of career plans, global health interests, medical knowledge and examination skills and measure change in these parameters after elective participation, and a need for studies that follow participants longitudinally through career stages to inform the long-term impact of these training experiences. Questions about the benefits of global health electives will be answered through carefully planned,

prospective studies that inform best practices for U.S. academic institutions and global partner sites.

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