



Value of Global Surgical Activities for US Academic Health Centers: A Position Paper by the Association for Academic Surgery Global Affairs Committee, Society of University Surgeons Committee on Global Academic Surgery, and American College of Surgeons' Operation Giving Back

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- BACKGROUND:** Academic global surgery value to low- and middle-income countries (LMICs) is increasingly understood, yet value to academic health centers (AHCs) remains unclear.
- STUDY DESIGN:** A task force from the Association for Academic Surgery Global Affairs Committee and the Society for University Surgeons Committee on Global Academic Surgery designed and disseminated a survey to active US academic global surgeons. Questions included participant characteristics, global surgeon qualifications, trainee interactions, academic output, productivity challenges, and career models. The task force used the survey results to create a position paper outlining the value of academic global surgeons to AHCs.
- RESULTS:** The survey had a 58% (n = 36) response rate. An academic global surgeon has a US medical school appointment, spends dedicated time in an LMIC, spends vacation time doing mission work, or works primarily in an LMIC. Most spend 1 to 3 months abroad annually, dedicating <25% effort to global surgery, including systems building, teaching, research, and clinical care. Most are university-employed and 65% report compensation is equivalent or greater than colleagues. Academic support includes administrative, protected time, funding. Most institutions do not use specific global surgery metrics to measure productivity. Barriers include funding, clinical responsibilities, and salary support.
- CONCLUSIONS:** Academic global surgeons spend a modest amount of time abroad, require minimal financial support, and represent a low-cost investment in an under-recognized scholarship area. This position paper suggests measures of global surgery that could provide opportunities for AHCs and surgical departments to expand missions of service, education, and research and enhance institutional reputation while achieving societal impact. (J Am Coll Surg 2018;227:455–466. © 2018 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)
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Members of the Academic Global Surgery Taskforce who collaborated on this article are listed in the [Appendix](#) available online.

Five billion people lack access to basic surgical services around the world.¹ Surgeons in the US, especially those who have had a long track record of mission work, are drawn to help address this unmet need. However, for low- and middle-income countries (LMICs) to be truly able to provide direct surgical care to this large population, they need help developing more robust surgical education, research, policy, and functioning health systems. Many predominantly mission-based collaborations have evolved into a defined field of global surgery, with a focus on helping build surgical capacity in LMICs across the academic tents of service, research, and education. However, there is still debate about the net benefit of global academic surgical work to US academic health centers (AHCs) or individual American surgical departments.¹

Academic productivity has well-established and measurable benefits to AHCs.² Excellence in service, research, and education drives the reputations of AHCs, creates value for society, and feeds back to increasing productivity across these aims (Fig. 1). However, these 3 aims generate a mix of monetary and non-monetary returns and challenge institutions to strike a delicate balance between short-term financial solvency, long-term reputation, and sustained societal impact, all of which are difficult to maintain. Many institutions are skeptical about investing in academic global surgical activities.

Historically, surgical faculty were valued for being a “triple threat” in teaching, research, and clinical service, much like Halsted,³ but this classic faculty member rarely, if ever, still exists. Changing economic environments, health care reform, and budget cuts have threatened the financial viability of many AHCs, resulting in increased pressure to focus on clinical productivity. Concurrently, there have been massive reductions of research support for surgeon-scientists.^{4,5} National Institutes of Health funding for surgical research has decreased by nearly 20% in the last decade.⁴ State and national funding for GME has been under constant threat.^{6,7} These funding issues dramatically affect how surgery departments and AHCs pursue their mission.^{4,8-11}

Despite these pressures, academic global surgery has evolved to become a legitimate academic area within surgery through a groundswell of interest among medical students, residents, and faculty.¹²⁻¹⁶ Global surgical research, innovation, and program development have grown rapidly.¹⁵ Such activities have been shown to be beneficial to US trainees by enhancing clinical skills, offering educational opportunities, and fostering a spirit of service.¹⁶⁻¹⁹

Yet, there has been little evidence describing the cost or value of global surgical work as it fits into the traditional academic mission of AHCs and surgical departments.²⁰ This position paper, developed by the Association for Academic Surgery (AAS) Global Affairs Committee, Society of University Surgeons (SUS) Committee on Global Academic Surgery and American College of Surgeons (ACS) Operation Giving Back, responds to these challenges, outlines the current investments, and formalizes a unique set of deliverables for this developing field.

METHODS

A task force of 10 surgeons was created from members of the AAS Global Affairs Committee and the SUS Committee on Global Academic Surgery to develop a position paper evaluating the state of the field of academic global surgery and determining the cost and output of US academic global surgeons.

There is no established list of academic global surgeons in the US today, nor is there an academic global surgical society or literature on the current productivity of US academic global surgeons. Therefore, the task force obtained primary data from the most active academic global surgeons based on their involvement in the AAS and SUS global surgical committees and the first ACS Global Health Competencies for Surgeons course held at the 2016 Clinical Congress. A snowballing technique was then used to identify a convenience sample of US surgeons recognized by their peers as having academic global surgical careers. An internet search for websites on global surgical programs was performed to identify additional

A preliminary version of survey results was presented at the Academic Surgical Congress 12th Annual Meeting, Las Vegas, NV, February 2017 by the Association for Academic Surgery Global Affairs Committee and the Society of University Surgeons Committee on Global Academic Surgery.

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Abbreviations and Acronyms

AAS	= Association for Academic Surgery
ACS	= American College of Surgeons
AHC	= academic health center
EI	= emotional intelligence
LMIC	= low- and middle-income country
SUS	= Society of University Surgeons

US surgeons who publicly self-identified as academic global surgeons but were not yet well known for their work at the national level. A total of 62 US surgeons identified as academic global surgeons were electronically contacted for the survey.

Survey development, conduct, and analysis

The task force developed survey content, including participant characteristics, definitions and qualifications of academic global surgeons, interactions with trainees, and career models for academic global surgeons (eDocument 1). A 59-question survey was created by a sub-group of the task force using REDCap (Research Electronic Data Capture) hosted at Virginia Commonwealth University.²¹ Questions were designed to capture responses in dichotomous answers, 5-point Likert scales, and open-ended responses. Evaluation of social capital is a growing field within organizational behavior and because there is no published assessment of such skills in surgeons, we included select emotional intelligence (EI) questions based on the Trait Emotional Intelligence Questionnaire-Short Form.²² The survey was approved as an exempt study by the Virginia Commonwealth University IRB (Jayaraman, Principal Investigator).

The survey was pretested by the task force for qualitative feedback on grammar, syntax, and interpretation to ensure face and content validity and then piloted within the group before it was sent electronically to the 62 previously identified US academic global surgeons. A reminder email was sent 2 weeks after the initial invitation. The survey was open for a total of 4 weeks. No identifying information was collected. Quantitative data were analyzed for summary statistics using SAS (SAS Institute) and assessed by extent of respondent's experience (more or less than 10 years) and compensation models (salary vs other). Statistical analysis was performed using chi-square test. Qualitative data were analyzed using content analysis and manually categorized into thematic areas.

Development of position paper

Using results from the survey, the task force developed and circulated 3 iterations in a modified Delphi technique

to obtain input on recommendations. The first iteration was purely a quantitative analysis of the survey data. The task force developed a second iteration as a position paper incorporating quantitative data into a larger more comprehensive statement. The interpretation of the survey results and creation of recommendations were largely agreed on by participants without substantial disagreement. This second iteration was then reviewed by survey participants and global surgery committee members of the AAS and SUS, to develop a third and final version of this manuscript. The final manuscript was then sent to the Executive Councils of the AAS and SUS and ACS Operation Giving Back for review and were endorsed as official positions of these professional societies.

Survey results

The survey was sent to 62 US academic global surgeons and had a 58% response rate (n = 36). Respondent characteristics are noted in Table 1.

Definition of an academic global surgeon

Participants agreed that an academic global surgeon has an appointment in a US medical school and does any of the following: spends dedicated time in an LMIC (81%), spends vacation time doing mission work (58%), or works primarily in an LMIC (56%) (Table 2). Other definitions had less agreement: foreign

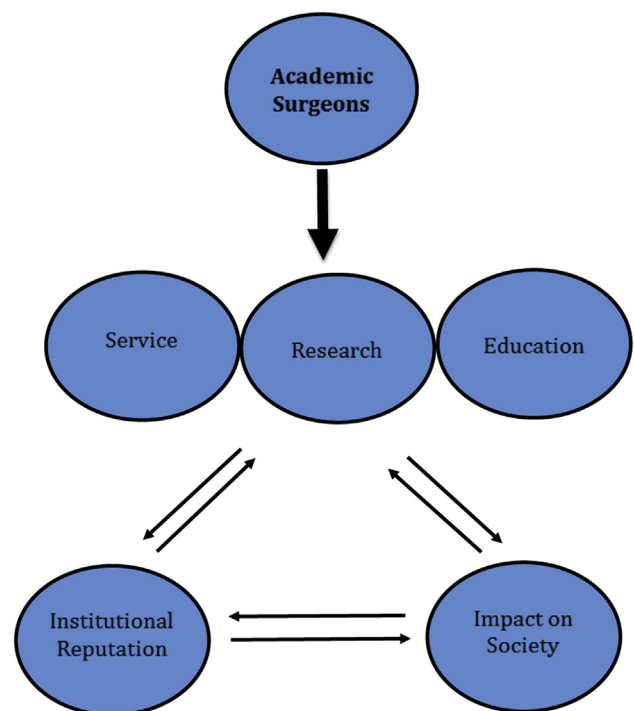


Figure 1. How surgeons add value to an academic health center.

Table 1. Participant Characteristics

Characteristic	n	%
Practice specialty	14	39
Acute care surgery	12	33
General surgery	12	33
Pediatric surgery	11	31
Trauma	10	28
Critical care	5	14
Surgical oncology	4	11
Hepatobiliary	2	6
Colorectal	2	6
Vascular	1	3
Burn	1	3
Urology	1	3
Minimally invasive surgery	1	3
Otorhinolaryngology	14	39
Years in practice		
<5	7	19
5–10	10	28
>10	19	53
Academic appointment		
Yes	34	97
No	1	3
Academic rank		
Assistant professor	12	35
Associate professor	9	26
Professor	13	38
Employment model		
University employed	23	64
Hospital employed	7	19
Private group	1	3
Other	5	14
Compensation model		
Salary	20	56
Relative value unit-based	12	33
Other	4	11
Partners in practice/group		
1–5	6	17
6–10	25	69
11–15	3	8
>15	2	6
Effort spent on global surgical work		
<25%	20	57
25%–50%	5	14
>50%	5	15
Time spend abroad annually		
<2 wk	9	25
2–4 wk	10	28
1–3 mo	11	31
>3 mo	6	17

(Continued)

Table 1. Continued

Characteristic	n	%
Vacation time used for global surgery work	20	57
Additional time desired for global surgery work		
Current amount is ideal	13	38
2 wk	1	3
1 mo	9	26
3 mo	10	29
Emotional intelligence		
Usually or almost always able to assess other's reactions when communicating decisions	26	74
Usually or almost always able to identify what motivates people at work	25	71
Usually or almost always able to handle frustration at work appropriately	26	74
Usually or almost always take cost into consideration during routine clinical care	30	86
Usually or almost always teach cultural variation in values, perspective, and behavior	32	91

medical graduate in the US with close ties to their country of origin (22%) or a renowned surgeon who gives lectures globally (0%). Qualitative themes used to define academic global surgery include health equity, education, research, and service in underserved populations (Table 3).

Time commitment

The majority (57%) of respondents dedicated <25% full-time equivalent to global surgical work and 67% were satisfied with the current amount or wanted to increase their time by 2 to 4 weeks per year.

Financial models

Twenty-three (67%) respondents were university-employed and 20 (56%) had salary-based compensation. A salary model was less likely to be the compensation paradigm for trauma surgeons (15% vs 50%, $p = 0.0335$) and intensivists (15% vs 44%; $p = 0.0732$) compared with other compensation models. Most ($n = 23$ [65%]) respondents report that compensation is equivalent or greater than that of their colleagues. Salaried respondents are more likely to report compensation is the same or more than colleagues when compared with other compensation models (85% vs 37%, $p = 0.0147$). Respondents with fewer than 10 years of experience in global surgery were more likely to receive travel allowances (47% vs 7%, $p = 0.0112$) and research support (43% vs 7%, $p = 0.0245$) for global surgical work.

Metrics of productivity and barriers

Most (83%) respondents reported that their department does not use specific metrics for global surgery

productivity. Respondents active in global surgery for more than 10 years were more likely to cite challenges with funding (93% vs 52%, $p = 0.0112$) and salary support (73% vs 38%, $p = 0.0489$) as barriers to global surgery.

Position Statement on the Value of Academic Global Surgeons to Academic Health Centers

Academic global surgery is a field of expertise within academic surgery that recognizes the academic impact of US surgeons in the global setting. This field is growing rapidly and is an evolution beyond the historically mission-based collaborations.^{20,23-26} Academic global surgeons in the US, who typically have appointments at US medical schools, spend dedicated time working with underserved populations, focusing on research, education, and health equity to improve surgical care globally. They add substantial strategic value to AHCs and surgical departments. Although they still form a fairly small group, these surgeons have created an unusual academic path within surgery and there is growing interest among students and residents to follow this trajectory. Leaders of AHCs and surgical departments might need guidance on what it means to support and meaningfully engage in this emerging field, as increasing numbers of trainees aim to establish careers in this field.

This position statement endorsed by the AAS and SUS Executive Councils and ACS Operation Giving Back seeks to legitimize this field by reporting on the costs and output of current US academic global surgeons and offering guidance to leadership on faculty recruitment, retention, and growth in academic global surgery.

This position paper makes the following recommendations:

1. Global surgery is a defined academic surgical specialty and avenues for promotion should be clearly delineated within the field.
2. US AHCs and surgical departments should recognize the value of academic global surgery. Due to the large burden of global surgical disease, the field is ripe for productivity in all academic spheres.
3. US academic surgical departments should provide support for academic global surgeons. There are many ways to show support. Protected time and funding are the 2 greatest needs for global surgeons. However, administrative, logistical, and statistical support are also critical.

A new paradigm for promotions

Measuring the productivity of academic global surgeons is key to valuing the work and maximizing returns. The

standard metrics for promotion in academic surgery translate poorly to academic global surgery just as to surgical innovation or surgical education.²⁷ Surgical innovators are not expected to create multiple patents per year nor surgical educators to implement multiple new and innovative teaching programs every year. Those would be impossible thresholds to meet and do not recognize the inherent difficulties in pursuing such scholarly activities. In academic global surgery, traditional metrics, such as the number of first- and senior-authored publications, have limited applicability because global surgical work is by definition collaborative across many LMIC partners. Academic global surgeons in the US might not always be first or last author on a publication even if they spearheaded the work because authorship is a crude tool to capture contributions of large and complex collaborations.²⁸ In addition, research in LMICs is often fraught with complications, such as political changes that affect research priorities and approvals, lack of reliable data, and inexperienced local staff. All of these can make it challenging to conduct high-quality research, but do not minimize the need for it. Lastly, depending on the LMIC setting, publication and research projects might not be a priority compared with clinical capacity-building needs.

Promotion and tenure mechanisms have changed over time, as the value of clinician educators to AHCs has become apparent.²⁹⁻³² We recommend a list of potential measurable outputs of global surgical work that can be valuable guides for AHC leadership when considering recruitment, retention, or promotion of academic global surgeons (eTable 1). The American College of International Academic Medicine recently published a consensus statement on output metrics that can be integrated into promotion and tenure paradigms to guide AHCs.³³ Even more nuanced metrics that include broader measures of social impact, equity, and access need to be developed over time.

Multidisciplinary and innovative collaborations

Academic global surgeons create innovative cross-disciplinary collaborations both within and between institutions. Academic global surgeons use specific background and expertise to develop global collaborations and participate in international societies and organizations advocating for global surgery. They have broad interdisciplinary and interprofessional collaborative networks across departments and divisions; health-related fields including pharmacy and nursing; and non-health-related professions, such as health economics, health policy, statistics, engineering, and health information technology. Global health partnerships result in both professional and personal development for the individual.³⁴

Table 2. Global Surgery Characteristics

Characteristic	n	%
Character of global surgical work		
Systems building*	34	94
Resident teaching	30	83
Research	27	75
Direct clinical care	24	67
Qualifications for current position		
Prior clinical experience in LMIC	32	89
Prior education and teaching in LMIC	29	81
Prior research experience in LMIC	28	78
Advanced degree or training	17	47
Collaboration with cross-disciplinary professional		
Within medicine	32	89
Across health care (pharmacy, nursing, dental)	20	56
Outside medicine (health economist, health policy expert, statistician, engineer, health informatic)	18	50
Current support for global surgery activity		
Administrative support	14	39
Protected time	12	33
Dedicated funding	11	31
Travel allowance	11	31
Current funding		
Departmental support	16	44
Philanthropic support	14	39
National Institutes of Health	3	8
Trainee mentorship in the last 1 y		
US trainee		
1–5 trainees	21	66
Research mentorship	28	78
Clinical mentorship	27	75
LMIC trainee		
1–5 trainees	23	75
Didactics	27	75
Research mentorship	25	69
Clinical mentorship	24	67
Metrics of academic global surgery productivity considered somewhat or very important		
LMIC investigator-led publication	32	89
Teaching curriculum development	32	89
Trainee mentorship	32	89
Customized teaching model	31	86
Peer-reviewed publication	30	83
Presentations at national/international conference	29	81
Creation of local database/project	28	78
Grant funding	26	72
Participation at national/international level	26	72
Surgical innovation	24	69
Clinical productivity in LMIC setting	12	33
Barriers to academic global surgery		
Funding	25	69
Clinical responsibility	24	67

(Continued)

Table 2. Continued

Characteristic	n	%
Salary support	19	53
Personal reasons	15	50
Resource for academic global surgery activity considered somewhat or very important		
Protected time	36	100
Administration	34	95
Research support	31	91
Salary support	31	86
Travel support	29	80
Promotion track	27	75
Definition of academic global surgeon		
US surgeon who spends dedicated time in LMIC setting	29	81
Surgeon spending vacation time doing mission work	21	58
Surgeon working primarily in LMIC but affiliated with US institution	20	56
Foreign medical graduate in the US with close ties to their country of origin	8	22
Renowned surgeon who gives lectures globally	0	0

LMIC, low- and middle-income country.

*Systems building activities are generally non-clinical functions that can include development or strengthening of prehospital trauma systems, cancer referral systems, and infrastructure development.

Although there is little known about the benefits of these broad networks to AHCs, organizational psychology literature notes that expansive relationships can drive additional productivity and lead to disruptive innovation.³⁵⁻³⁷ We argue that this applies to global surgery and innovation efforts in low-resource settings.

Professionalism

Academic global surgeons, by working across cultures, languages, and values, might be more adaptable, cost aware, and empathetic, and bring greater self-awareness and social skill to the workplace. Our survey, using questions derived from an extensively validated EI questionnaire, is the first to look at this topic in academic global surgeons. Respondents usually or almost always assess other people's reaction when communicating decisions to them. They report no or minimal difficulty identifying what motivates people at work and believe they handle frustration usually or almost always appropriately. Respondents take cost into consideration during routine clinical care and teach about cultural variations in values, perspectives, and behaviors. Although there are no published comparative data on EI of US surgeons, the need to build a respectful and diverse culture within the field of surgery is increasingly recognized by AHCs and surgical departments. This is also relevant to clinical care delivery, as racial and ethnic minorities in the US receive lower quality of health services and have worse health status indicators than their white counterparts.^{38,39}

We argue that academic global surgery might represent a unifying force in academic departments that can

build culture through principles of humanitarianism, cultural enrichment, global social justice, and a return to the basic roots of medicine—at low cost. This becomes increasingly important in an era of administrative and regulatory pressures that can erode departmental culture and increase surgeon burnout. Increased EI strongly correlates with mental well-being and inversely with characteristics of burnout in surgical residents.⁴⁰ Global health work has been shown to improve both personal and professional development.³⁴ Although not all academic global surgeons are experts in EI, the value of these skills is being established in organizational behavior and is just as relevant to medicine and surgery. Academic global surgery offers the potential to develop nontechnical abilities among surgeons, change institutional culture, and therefore influence positive returns to AHCs.

Facing the future challenges of health care at home

The concept of “local to global and global to local” in academic global surgery permeates the academic mission, spurs institutional reputation, and contributes to society at both the local and global level.^{41,42} As the US transitions to value-based health care, AHCs have opportunities to make advances for low-cost, high-quality surgical care to reduce the high cost of surgical care in high-income countries and revolutionize surgical care for LMICs.⁴³ Working in LMICs gives the academic global surgeon the perspective to partner with diverse groups and develop innovative and affordable devices that can reduce health care costs domestically. A great example of this is the

Table 3. Qualitative Themes from Survey Responses

Theme	Example
Defining global surgeon Health equity	<p>“A surgeon who is involved in global efforts to improve access to surgical care by clinical means, educational activities, advocacy, assessments and system development and strengthening, and research.”</p> <p>“A surgeon who spends significant time both working in countries other than his/her own and also is engaged in working on the challenges of global surgical equity.”</p>
Education, research, and service	<p>“Surgeon from either HIC or LMIC who is committed to improving care in LMICs through education, service, and research.”</p> <p>“Someone who helps LMICs build capacity through research and education.”</p>
Underserved population	<p>“A surgeon who devotes his or her time to understanding and improving surgical care and delivery to underserved populations wherever they exist worldwide.”</p> <p>“Definition may be based on serving vulnerable community; we make a big deal that local is global too in principle although not so much for the purposes of this survey.”</p>
Output measure to evaluate academic global surgeon	
Training and mentorship of LMIC surgeon	<p>“Training/mentorship for LMIC surgeons = very important. Training/mentorship for HIC surgeons in global surgery = not very important.”</p> <p>“LMIC surgeon training.”</p>
Capacity building	<p>“Capacity building: how much is the LMIC site able to do independently because of the visitor.”</p> <p>“Concrete measures of capacity building at the ground level based on the perceived and real needs of a specific country or region should be the goal. There’s a lot of dabbling in global surgery. People in LMICs need to be trained. Hospitals need supplies and finances for infrastructure.”</p> <p>“Creation of projects is easy. Sustaining them is hard. The measure of productivity can often not be determined until some time has passed to determine effectiveness—3 to 5 years at least.”</p>
Support and recruitment of trainee interested in global surgery	<p>“I think that there [sic] is definitely more funding for residents and students and that securing funding for them should be a metric used for us as a way to show our impact. They are not able to secure funding without an adequate mentor/principal investigator.”</p> <p>“Another metric would be the ability to recruit residents/trainees, students/and even other faculty recruits who have this interest; as well as anyone who is leading cross departmental collaborations of any kind at their institutions or within institutions.”</p>
Essential resource	
Recongnition of the value of global surgical work	<p>“I think giving value to our work and allowing the flexibility that our ‘lab’ is international is critical.”</p> <p>“Not sure that the track needs to be different, just the metrics better defined, and greater acceptance by surgical leadership.”</p> <p>“Highlighting how global health/surgery fits into the promotion tracks.”</p>

HIC, high-income country; LMIC, low- and middle-income country.

low-cost laparoscope developed by surgeons at the University of Utah. This area is undefined and open for additional research.

Global surgical activities can promote the recruitment of faculty and trainees who are able to work

collaboratively and problem-solve in situations of scarcity and high clinical volume and can also boost recruitment for global health faculty in other disciplines because of the field’s collaborative nature. Global surgical work can be an effective marketing tool for AHCs to support

legacy-building global outreach activities. Recognizing these benefits, AHCs are developing partnerships with institutions around the world by integrating clinical knowledge and skills, supporting nascent training programs, and offering support for research or policy development.^{23,41,42,44-46} The National Academies of Sciences, Engineering, and Medicine recently published a report on the value of global health engagements, encouraging stakeholders to participate in addressing global health priorities in LMICs.⁴⁷ The value of global health work has also been echoed by the US military.⁴⁸

Education

Clinical teaching and research mentorship represent a major source of academic productivity for global surgeons. Participants reported efforts ranging from training US trainees to curriculum development for colleagues and trainees in other countries. Nearly all had mentored US trainees in the last year in research, clinical education, and mentorship. This correlates with strong demand for such opportunities from trainees.^{12,44,49,50} During a 5-year period, the number of global surgery electives has increased from 23 to 34.^{39,51} This is supported by the ACGME and the American Board of Surgery, which allow credit for cases performed abroad. Programs focusing on global surgery fellowships provide specialized training in the field.^{52,53} As demand from trainees for these clinical opportunities increases, AHCs can leverage academic global surgical faculty to meet this domestic need, while expanding institutional reputations globally.

Time commitment

An important concern for AHCs with regard to global surgical collaborations is the potential for lost clinical productivity when a surgeon is away from the home institution, but this does not appear to be the case. Although respondents are among the most active academic global surgeons, most reported spending fewer than 3 months abroad annually and half spent less than 1 month away annually. The majority spent only a quarter of their effort on global surgical activities and most did not want to increase their time away, or wanted only a negligible increase per year. This suggests that the most common paradigm for academic global surgeons is not to take vast amounts of time away from clinical duties at their home institution. Additionally, the majority reported little negative salary impact of their global surgical work. Potential lost compensation, if considered a proxy for lost revenue for AHCs, does not seem to be a major issue in this population. The relative value unit productivity of academic global surgeons can be similar to that of their peers engaged in other forms of scholarly activity,

especially for surgeons covering emergency surgery. Partial full-time equivalent support for an academic global surgeon generally represents a very small fraction of the total salary budget of a large academic surgical department with potential for substantial return compared with the decreasing rates of support for achieving independent surgical-investigator status for traditional models of research.

Funding

Academic global surgeons are effective at bringing in funding from a variety of sources including departmental, philanthropic, and federal sources; none reported support from the 4 leading US professional surgical societies. Several academic global surgeons secured funding through non-profit organizations. Historically, the NIH's Fogarty International Center has been the lone supporter of global trauma and surgery work.⁵⁴⁻⁵⁷ However, federal funding opportunities to support academic global surgery are increasing based on data from the Lancet Commission on Global Surgery, the Institute of Health Metrics' Global Burden of Disease collaboration, the World Health Organization, and the World Health Assembly 68.15 resolution to increase funding for emergency and essential surgical capacity building.⁵⁸⁻⁶³ The NIH has put out 2 requests for applications^{55,56} in the last few years to support work in non-communicable diseases and injuries. The global burden of disease is increasingly becoming skewed toward non-communicable diseases, many of which need surgical care for optimal outcomes. As global funders recognize this epidemiologic shift and start to fund work on non-communicable diseases, academic global surgeons and their institutions would be wise to be prepared for such interest.

Remaining challenges and obstacles

Institutional support for global surgical activities has been increasing with time. The majority of survey participants noted protected time as the most important mechanism of departmental support and 92% noted lack of promotion credit for global surgery work as the major barrier to their involvement. In a survey conducted by Operation Giving Back, respondents cited paid time off as a desired option to support global surgery initiatives.⁶⁴

The capacity to support academic global surgical activities is likely to vary across divisions and institutions and is influenced by the size of the practice group. The culture of the division and the support of colleagues are crucial to the success of academic global surgical programs. Most survey participants were employed by a university hospital with 6 to 10 partners, suggesting that there might be a threshold that influences flexibility to spend time abroad.

Some divisions, such as trauma and surgical critical care, where workload is increasingly shared among partners in a group, might be more amenable to academic global surgery. Division size does not restrict sporadic surgical mission work, which can support institutional reputation building for smaller institutions compared with a large AHC.

Physician compensation models, which are increasingly leading to productivity-based models and moving away from historic fee-for-service and salary-based models, are important challenges to address.⁶⁵⁻⁶⁷ The AHCs and departments of surgery might need to develop different compensation plans for those engaging in academic global surgery.

Limitations

There is wide variability in the conduct of academic global surgery, a nascent field. The total number of academic global surgeons surveyed was small, as there is no existing registry of academic global surgeons. Global surgeons were primarily identified based on active engagement in global surgery activities of the AAS, SUS, and ACS. There are likely other surgeons engaged in academic global surgical work who are not as active in these societies. In addition, these organizations are predominantly represented by general surgeons. This report does not aim to represent every existing model, nor does it include numerous subspecialties with long histories of engaging in global surgical mission work, such as plastic surgery, otorhinolaryngology, orthopaedics, and neurosurgery. This survey did not include global surgeons without an academic affiliation, who also do valuable work, or AHCs that have made major LMIC investments beyond academic surgery. Although it is not within the scope of this paper, there are also surgeons in faith-based organizations or private practice who engage in global surgical activities and might have opted out of an academic career for various reasons. By assessing the productivity of the most active academic global surgeons, this position paper highlights those who succeed despite any number of challenges noted.

CONCLUSIONS

Global surgery is an essential part of global health care, as an estimated 30% of all diseases globally require surgical care and expertise.^{1,68,69} There is substantial need for engagement by academic global surgeons, surgery departments, and AHCs. This position paper argues that academic global surgeons represent a low-cost, high-yield investment to the modern AHC with a substantial return on investment that abets the academic mission of AHCs,

builds reputation, culture, and identity, and has broad impact on society. Global surgical work should be considered an essential component of the academic surgical department. Global surgical activities can have tremendous impact on trainee education, provide opportunities for reverse engineering, address domestic surgical disparities, and potentially enhance recruitment of the best and brightest trainees. Academic health centers and departments of surgery can leverage the growth in academic global surgery to enhance institutional reputation and create a broad impact on society with an enduring legacy.

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APPENDIX

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eDocument 1. Survey Questions

Participant characteristics and experience

In what setting are you based for >50% of your time?

What is your practice specialty? (can select multiple answers)

How many years have you been in practice?

Do you have an academic appointment?

What is your academic appointment?

How would you define a “global surgeon”? (can select multiple answers)

What qualifications do you think a surgeon needs to have to be considered an academic global surgeon? (can select multiple answers)

Global surgical work

How long have you been practicing global surgery?

What qualifications in global surgery did you bring to your current position? (can select multiple answers)

Do you collaborate with cross-disciplinary professionals in your global projects?

How many different LMICs do you collaborate in currently?

How much time do you spend abroad each year (on average)?

How much additional time would you like to spend doing global surgery every year if you could?

What are your top 3 barriers to doing more global surgery? (select 3)

Do you use vacation time for global surgery work?

How would you define your involvement global surgery? (select all that apply)

Mentorship of trainee

Do you or have you mentored US trainees in global surgery activities since starting as faculty?

Do you work with students or residents? (can select multiple answers)

In what capacity do you mentor US trainees in global surgery activities? (select all that apply)

How many US trainees have you mentored in global surgery in the past year?

Do your US residents log operating room cases from international experiences toward their ACGME requirements?

Do you or have you mentored LMIC trainees in global surgery activities since starting as faculty?

In what capacity do you mentor LMIC trainees in global surgery activities? (select all that apply)

How many LMIC trainees have you mentored in the past year?

Career model

How would you describe your practice model?

How many surgeons are in your group or division?

What is your compensation model?

How does your compensation differ compared to colleagues in your division who are not doing global surgery? (Likert scale: significantly more, more, same, somewhat less, significantly less, no idea)

Please describe any differences in compensation that you are aware of. (optional)

What is your percent effort toward global surgical activities?

What academic support do you receive for your global surgical effort? (select all that apply)

What funding sources do you currently have for global surgical work? (select all that apply)

Metric of productivity

Does your department or division currently use a specific set of metrics to measure your productivity for your global surgery effort?

This section will ask about what measures of output/productivity you think should be used to evaluate US academic global surgeons. (Likert scale: very important, somewhat important, neutral, minor importance, not important)

Clinical productivity by US global surgeons in LMIC setting

Peer reviewed publications on global surgical topic

LMIC investigator led publication through mentorship from HIC global surgeon

Grant funding to conduct global surgical work

Creation of database or local project in LMICs

Established teaching curriculum in LMIC setting

Created customized teaching model in LMIC setting

Trainee mentorship for US and/or LMIC trainee

(Continued)

eDocument 1. Continued

Surgical innovation for/in the LMIC setting

Leadership/participation in organizations at national or international level

Presentation at national or international conference (by faculty or trainee)

Other

Barriers and challenges

This section will ask you which resources from departments and institutions are most essential to support academic global surgery careers. (Likert scale: very important, somewhat important, neutral, minor importance, not important)

Protected time to conduct global surgery as a part of clinical/academic practice

Research support

Salary support during time abroad

Administrative support to develop research or curricula, or to mentor trainee

Support for travel

A separate promotion track/promotion requirements specific to global surgery

Other

This section will ask you about the most important challenges for the field of global surgery in your opinion. (Likert scale: very important, somewhat important, neutral, minor importance, not important)

Lack of federal funding to conduct global surgical work

Availability of protected time to conduct global surgical work as a part of clinical practice

Ability to be recognized for global surgical work in academic promotion

Lack of model for equity in authoring publications between HIC and LMIC authors

Lack of mentorship by funded global surgeon

Availability of LMIC infrastructure to conduct research

Availability to create bilateral exchange opportunities for LMIC clinicians to visit/participate in the US

Support for presenting global surgical work at US conference

Other

This section will ask about your behavior at work in the US compared with your division colleagues who do not participate in global surgical work. (Likert scale: almost never, seldom, sometimes, usually, almost always)

I consider the way others might react to decisions when communicating them.

I find it difficult to identify the things that motivate people at work.

When I get frustrated with something at work, I discuss my frustration appropriately.

I take cost into consideration during routine clinical care.

I teach about cultural variations in values, perspective, and behavior.

Other

Final section

Is there anything else you would like to add that this survey has not mentioned on the topic of careers in global surgery?

Would you be willing to participate in future Association for Academic Surgery surveys on global surgery only?

HIC, high-income country; LMIC, low- and middle-income country.

eTable 1. Measurable Global Surgical Output of US Academic Global Surgeons

Domain, example, output metric
Education
HIC trainee (resident and medical student)
Traditional general surgery (clinical history taking, physical exam, open surgery)
Global surgery rotation and curriculum
LMIC trainee (medical student, resident, non-physician clinician, faculty)
Clinical service
Research
Local innovation
Program development and administration
Curriculum development
Exam development and administration
Output metric
Training mentorship (LMIC and/or HIC)
Number of medical students mentored
Number of surgical trainees mentored
Number of surgical faculty mentored
Number of nonsurgical trainees mentored
Number of nonsurgical faculty mentored
Number of nonphysician staff mentored
Curriculum development (LMIC and/or HIC)
Program curriculum for residency or fellowship
Clinical rotation curriculum
Teaching module
Simulation course
Teaching tool
Lectures
Journal club
Simulation exercise
Conduct of exam
Writing exam questions (multiple choice questions, objective structured exam)
Administering exam (oral exam, viva voci)
Serving as external examiner
Clinical skills courses developed
Number of clinical skills courses developed
Number of clinical skills courses conducted
Number of attendees at courses
Thesis quality—publishability of theses from residency training
Number of LMIC trainees attending local accreditation such as West African College of Surgeons or College of Surgeons of East, Central and Southern Africa
Clinical service
Short- or long-term mission and outreach program to decrease burden of surgical disease
Partnering with local faculty to manage complex case
Apprenticeship model of training
Reverse innovation to translate low-cost practice model to high-income environment
Output metric
Clinical productivity
Number of operations performed
Complexity of cases able to be safely performed
Transference of clinical skills to LMIC faculty

(Continued)

eTable 1. Continued

Domain, example, output metric
Patient care outcome, including follow-up
Morbidity and mortality rate
Perioperative mortality rate
Hospital length of stay
Development of a tumor board
Research
Database development
Trauma
Cancer
Congenital anomaly
Other
Quality improvement
Cost-effectiveness analysis
Educational research
Surgical innovation
Ethics
Outcomes
Output metric
Publication
Number of peer-reviewed publications
LMIC investigator-led publication
Trainee-led publication (LMIC or HIC)
Presentation
Number of presentations at conference
LMIC investigator-led presentation
Trainee-led presentation (LMIC or HIC)
Grant
Development of grant infrastructure
Number of grant received
Size of grant received
Funding for residents and student
Funding for HIC junior faculty
LMIC collaborator funding
Intellectual property
Number of innovations/patents/licensing agreements
Number of research staff employed
Number of databases or local projects
Use of research infrastructure by others
Number of quality improvement programs
Number of different collaborators engaged
Change in practice or research as a result of educational intervention
Other measure
Leadership
Advocacy
Lancet Commission
Alliance for Surgery and Anesthesia Presence
Disease control priority
World Health Assembly

(Continued)

eTable 1. Continued**Domain, example, output metric**

G4 Alliance
Within professional society
Other
Program administration
Policy development
System/capacity building—how much the LMIC institution is able to do independently
Output metric
Roles on relevant board and committee
Number of visiting professorships
Number of speaker/conference invitations
Number of media mentions
Number of invitations from policy makers
Number of policy guidelines/reports created
Administrative leadership of program and collaboration
Leadership position in national and international organization
Global surgery award

HIC, high-income country; LMIC, low- and middle-income country.