



United States-based global otolaryngology surgery: A call to more horizontal sustainable efforts

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ABSTRACT

Objective: To examine global surgery involvement among general members of the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) and characterize international otolaryngology surgical interventions.

Methods: Data on global surgery involvement were derived from responses provided by voluntary online survey respondent members of the AAO-HNS, obtained in October 2017. These data were compared against World Bank metrics of national health expenditure and surgical specialists per capita as benchmarks for need.

Results: There were 362 responses (response rate of 3.7%). A large proportion of respondents reported being involved in global surgery (61.3%). Locations where respondents worked included: South America (13.3%), Central America (17.7%), Caribbean (10.2%), Europe (4.1%), Africa (16.3%), Asia (16.6%), the Middle East (4.1%), and Oceania (3.6%). A greater proportion of respondents reported traveling to locations that have lower health care expenditure per capita and lower mean number of surgical specialists per 100,000 people, according to data from the World Bank. The primary purpose of trips was most commonly surgical mission (60.3%), followed by education (37.8%), and research (1.9%).

Conclusion: Members of the AAO-HNS are active in global surgery efforts around the world. Collaboration among members of the AAO-HNS may serve to improve long-term sustainability of these efforts.

1. Introduction

In our increasingly globalized world, surgery too has become “globalized”, permitting surgeons to practice in distant locations with increasing ease. These actions are often motivated by service, research, and education, to name a few. The field of global surgery has grounded itself on the improvement of surgical services for the 5 billion people who lack access to safe surgery and anesthesia [1,2]. Previously referred to as the “neglected stepchild of global health” [3], surgery’s importance as a critical component of global health has been increasingly discussed [1,3–6].

There exist different models to help fill the unmet need for surgical care, with varying degrees of effectiveness and sustainability [7]. Academic interest in global surgery has increased in recent years, with otolaryngologists playing a significant role in drafting the 2015 Lancet Commission on Global Surgery [1] and an overall increase in otolaryngology global surgery publications [8]. This suggests a greater

interest and awareness within otolaryngology; however, the extent and character of global surgery involvement among practicing otolaryngologists in the United States remains largely unstudied. We sought to evaluate the involvement of American otolaryngologists in international surgical endeavors and to characterize these endeavors.

2. Materials and methods

Study participants included all general members of the AAO-HNS with a documented email address in October 2017. The survey was reviewed and approved by the AAO-HNS Humanitarian Affairs Committee, then distributed via an online, electronic resource (surveymonkey.com) [9]. The survey asked a broad range of questions regarding involvement in global surgery, duration and frequency of that involvement, region of the world, and primary purpose of the trip. Results were anonymous. This study used a database free of any identifying information; therefore, institutional review board approval was

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Table 1
Participation in global surgery among responding members of the American Academy of Otolaryngology-Head and Neck Surgery, October 2017.

	Number of participants (%)
Participants who reported working abroad (n = 362)	222 (61.3)
Locations worked abroad in the last 10 years (n = 362)	
South America	48 (13.3)
Central America	64 (17.7)
Caribbean	37 (10.2)
Europe	15 (4.1)
Africa	59 (16.3)
Asia	60 (16.6)
Middle East	15 (4.1)
Oceania	13 (3.6)
Primary purpose of trip (n = 209)	
Surgical mission	126 (60.3)
Educational focus	79 (37.8)
Clinical outcomes research/data collection	4 (1.9)
Trip duration (n = 202)	
Less than 1 week	57 (28.2)
1–2 weeks	130 (64.4)
3–4 weeks	8 (4.0)
More than 4 weeks	7 (3.5)
Number of international trips in one's career (n = 210)	
1	42 (20.0)
2–5	86 (41.0)
6–10	32 (15.2)
More than 10	50 (23.8)
Return to same international site more than once (n = 362)	125 (34.5)
Number of international surgical sites visited (n = 212)	
1	72 (34.0)
2–5	113 (53.3)
6–10	19 (9.0)
11 or more	8 (3.8)

not required.

World Bank data on national health expenditure per capita and surgical specialists per 100,000 population was interrogated [10]. Average national health expenditure per capita and surgical specialists per 100,000 population were calculated by region used in the survey (South America, Central America, Caribbean, Europe, Africa, Asia, Middle East, and Oceania). Data for national health expenditure per capita in 2014 was complete, however data for surgical specialists per 100,000 population required integration for years 2008–2016.

Fisher's exact test was used when possible for comparisons; otherwise, Chi-square test was used. All p-values were two-tailed. Statistical analysis was performed using STATA software, version 15.1 (StataCorp LLC, College Station, Texas).

3. Results

Questionnaires were sent to 9903 unique email addresses. There were 362 responses (response rate of 3.7%). Data on participant involvement in global surgery are shown in Table 1. 61.3% of respondents reported being involved in global surgery. Locations where respondents have worked included: South America (13.3%), Central America (17.7%), Caribbean (10.2%), Europe (4.1%), Africa (16.3%), Asia (16.6%), the Middle East (4.1%), and Oceania (3.6%) (Fig. 1). The most common primary purpose of a trip was to participate in a surgical mission trip (60.3%), namely for the provision of surgical care. The majority of trips made by respondents were less than 2 weeks duration (92.6%). A large number of respondents reported having participated in more than one international surgical trip, and having participated in trips at multiple sites. Participants who reported returning to the same site were more likely to be involved in trips with a primarily

educational purpose (51/125; 59.2%) compared with participants who did not report that they returned to the same site (17/45; 37.8%), but this difference did not reach statistical significance ($p = 0.86$).

The mean national health expenditure per capita (in current United States dollars) in 2014, grouped by region, is shown in Fig. 2. The mean number of surgical specialists per 100,000 people between 2008 and 2017, grouped by region, is shown in Fig. 3. Of note, Africa had the lowest mean national health expenditure per capita (146.5), whereas Europe had the highest (2870.8). Similarly, Africa had the lowest mean number of surgical specialists per 100,000 people (4.9), whereas Europe had the highest (84.4).

4. Discussion

Evaluating the current state of otolaryngology global interventions provides a baseline of understanding within our specialty. To make significant impacts in global burden of otolaryngology specific diseases, we must understand current efforts; that is where we are and what is the nature, pattern, and distribution of current efforts.

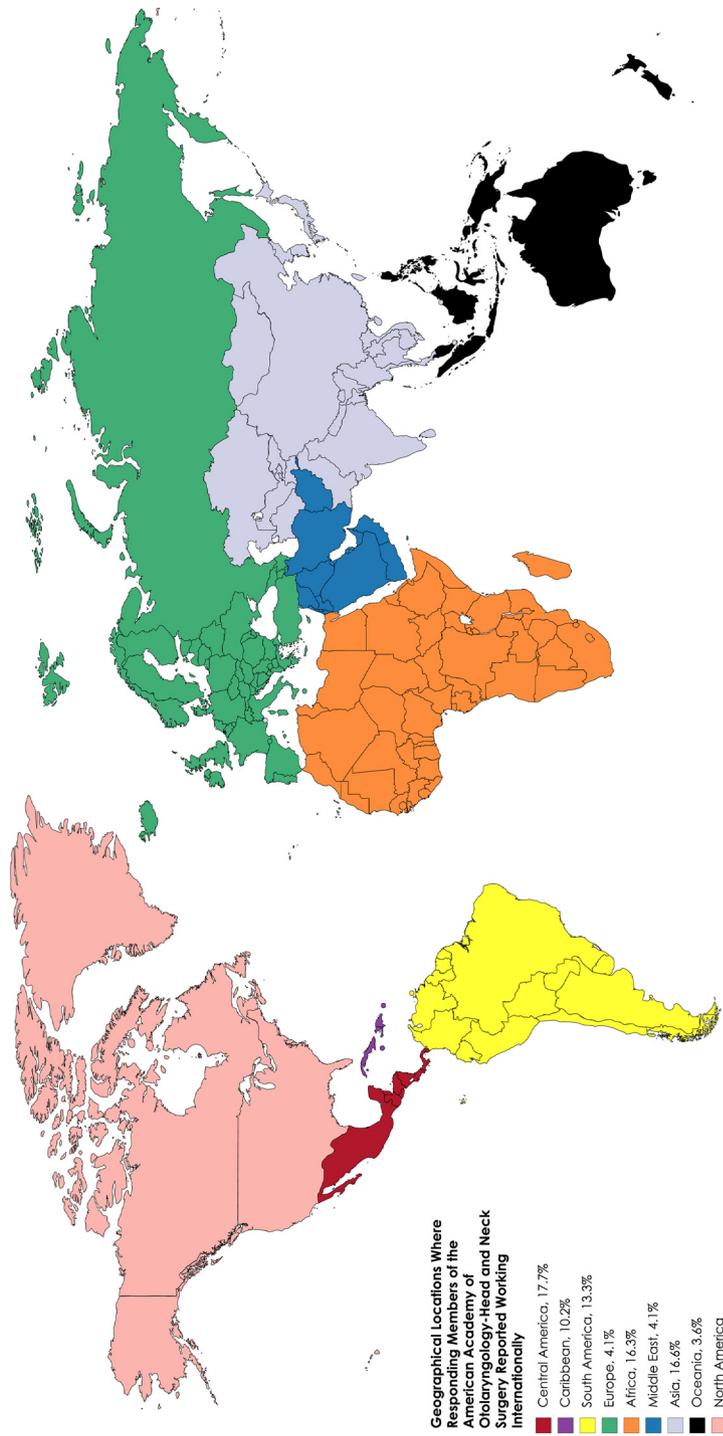
Global surgical interventions may be categorized in a variety of ways. Categorization based on purpose may orient surgical interventions by service, education, and research, for example. Alternatively, global surgical interventions may be characterized by their method of interaction [11]. For example, a “vertical” intervention, one that addresses a specific disease, need, or patient population, is often self-contained with little interaction with local health systems or personnel. While this method may be the easiest to facilitate, it may not contribute to sustainable change in surgical care systems. Self-contained “vertical” interventions may, however, be useful to address certain surgical problems in the short-term, for example during times of natural disasters, conflict, or temporizing disease burdens. Examples include short-term specialty surgical missions, surgical aid ships, and self-contained surgical airplanes.

A “horizontal” intervention takes the form of a longer-term partnership focused on strengthening infrastructure. For these reasons, horizontal interventions often require more human resources and capital investment. While more often than not horizontal partnerships center around providing care, the focus is sustainability. Frequently this involves surgical education to address the surgical workforce crisis and hospital systems strengthening. Examples of horizontal interventions include the Human Resources for Health Program in Rwanda [12], or long-term north-south academic partnerships [13–15].

American otolaryngologists reported the most common primary purpose of international surgical trips was “surgical mission trips” (60%), namely service, or surgery in and of itself. While this is undoubtedly helpful for those patients served, service alone – a “vertical” intervention – often fails to catalyze sustainable change unless integrated with education or research.

Surgical training in its essence relies on an apprenticeship model. Training gradually evolves from observation, to assisting, to performing surgery under supervision, to independent surgical practice. Thus, any global surgery intervention that offers care to patients has the simultaneous opportunity to contribute to sustainable change through education. The inclusion of local trainees, surgeons, operating room staff, nursing, partnering with local universities, running hands on workshops in parallel with surgical days, cadaver workshops, equipment donations, or dedicating a day to educational lectures are but a few examples. In this way, a “vertical” model becomes “diagonal” [16]. In fact, 30% of AAO-HNS survey respondents listed surgical education – a “horizontal” intervention – as the primary purpose of global surgical interventions, therefore this may already be happening.

Ideally, American otolaryngology global surgery efforts would be proportional to need. In reality, many random factors determine where international otolaryngology surgery efforts take place aside from demonstrated need. If surgical specialists per 100,000 and mean national health expenditure per capita are used as proxy indicators for



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Fig. 1. Geographical locations where responding members of the American Academy of Otolaryngology-Head and Neck Surgery reported working internationally.

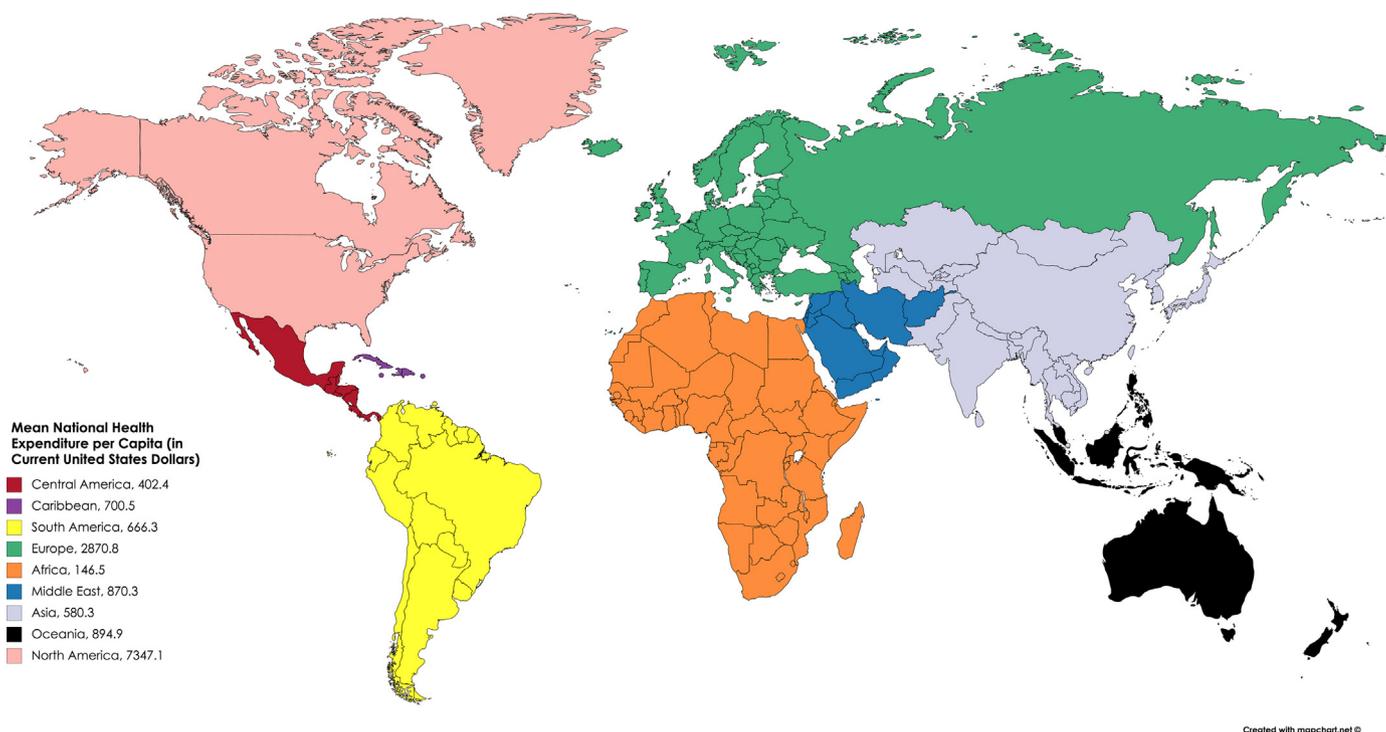


Fig. 2. Mean national health expenditure per capita by region (World Bank), 2014.

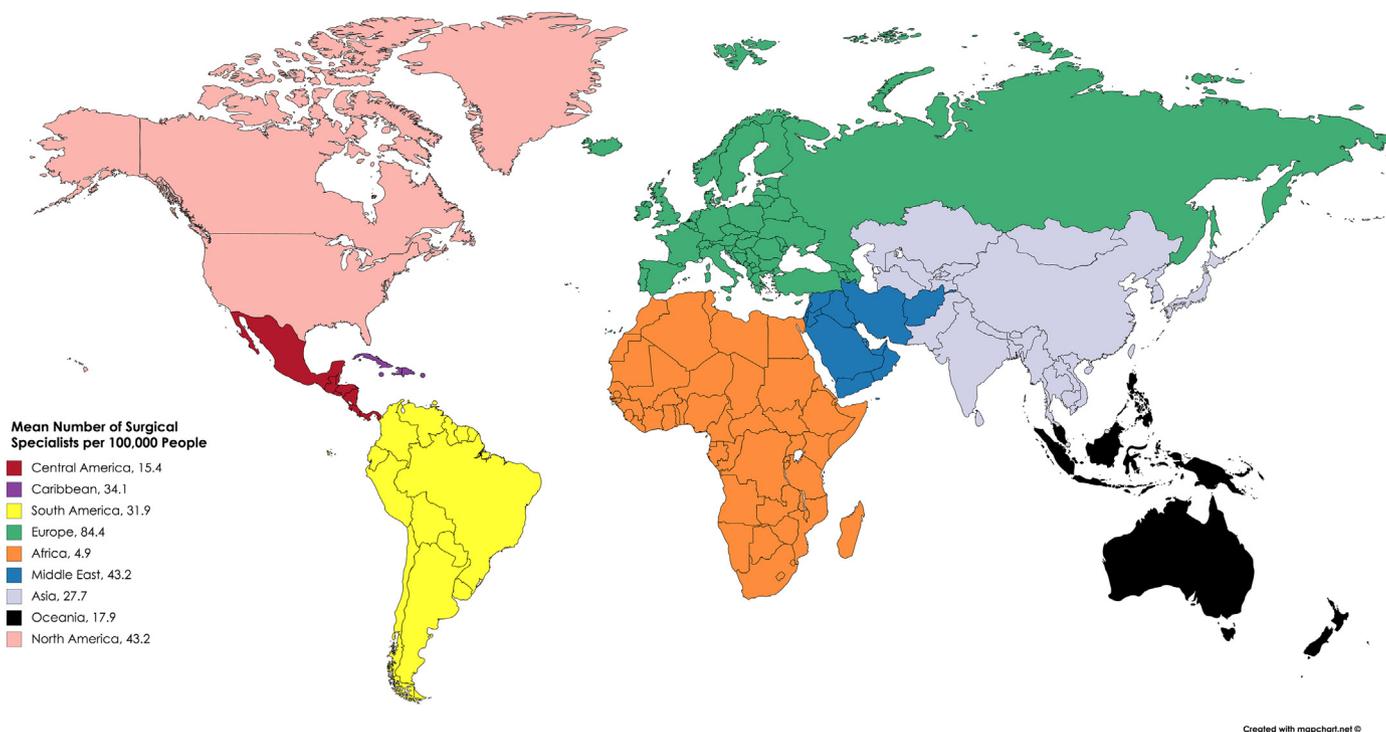


Fig. 3. Mean number of surgical specialists per 100,000 people by region (World Bank), 2008–2017.

otolaryngology need, then we are able to grossly evaluate if American otolaryngology efforts correlate to this need.

The most common global surgery destination in our study was Central America (17.7%) followed by Asia (16.6%), Africa (16.3%), South America (13.3%), the Caribbean (10.2%), Europe and the Middle East (4.1% each), and Oceania (3.6%). When comparing these data to the mean national health expenditure per capita and mean number of surgical specialists per 100,000 people in these geographical regions, it

is noteworthy that otolaryngologists appear to be more involved in geographical regions that have lower health care expenditure per capita and lower mean number of surgical specialists per 100,000 people. This suggests that otolaryngologists are going to destinations that may have a higher unmet need for surgical care. The greater number of otolaryngologists participating in global surgery in Central America compared to other regions, and the relative dearth of otolaryngologists involved in global surgery in Oceania may suggest that geographical

proximity, and therefore convenience of travel, may be a factor that influences choice of destination among participants.

Of note among participants who reported involvement in global surgery efforts was that most individuals reported involvement in more than one global surgery trip. The reasons for these findings are unclear. It may suggest that individuals who are exposed to global surgery experiences tend to have positive experiences, leading to continued involvement in these efforts. Conversely, it may reflect a selection bias that people with more international surgery experience were more likely to participate in our voluntary survey.

Trip duration was significantly associated with primary purpose of one's trip. Although it is unclear why this is the case, it is possible that the duration of one's trip varies by purpose. For example, a surgical mission trip may require less time than a trip that is meant to have an educational focus. Further investigation is needed to better understand the implications of this finding.

In our study, approximately one-third of respondents (34.5%) reported that they returned to the same international site more than once. Having participants return to the same international site is important for continuity of care, and contributes to the formation of an educational foundation. Although we did observe a greater proportion of participants reporting a primary educational purpose among those who returned to the same international site more than once (59.2% compared with 37.8%), this difference did not reach statistical significance.

This study has limitations. The overall response rate for our study was relatively low (3.7%). Therefore, there is likely voluntary response bias; it is likely that individuals with a personal interest in global surgery were more likely to respond to the voluntary survey request. However, responses from these individuals are likely most relevant given their presumed involvement and experience in this field. As such, the proportion of AAO-HNS members involved in global surgery is likely significantly lower. This study did not collect demographic data on survey respondents nor did it detail types of procedures performed.

5. Conclusion

Members of the AAO-HNS are involved in global surgery efforts throughout the world and members are more involved in regions of the world with lower health expenditure per capita and lower densities of surgical specialists. The primary purpose of these endeavors was service, followed by education. Efforts to move towards more “horizontal” global surgery interventions are imperative as global surgery interest continues to grow among AAO-HNS members. Additional research in this area would serve to better characterize the nature of current US based global otolaryngologic surgical work and future efforts.

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