



ORIGINAL RESEARCH

Bidirectional needs assessment of otolaryngology–head and neck surgery short-term surgical trips in Zimbabwe

Katerina J. Green MB Bch BAO¹  | Naboth Matinhira MB ChB² | Amiti Jain BS³ | Priya Arya BS⁴  | Dontre' M. Douse MD⁵ | Titus Dzongodza MB ChB² | Clemence Chidziva MB ChB⁶ | Joshua P. Wiedermann MD FACS³

¹Department of Otolaryngology-Head and Neck Surgery, Mayo Clinic, Jacksonville, Florida, USA

²Department of Otolaryngology-Head and Neck Surgery, University of Zimbabwe, Harare, Zimbabwe

³Department of Otolaryngology - Head and Neck Surgery, Thomas Jefferson University Sidney Kimmel Medical College, Philadelphia, Pennsylvania, USA

⁴Department of Surgery, Mercer University School of Medicine, Savannah, Georgia, USA

⁵Department of Otolaryngology-Head and Neck Surgery, Mayo Clinic, Rochester, Minnesota, USA

⁶Department of Otolaryngology-Head and Neck Surgery, Harare Eye, Ear, Nose, Throat Institute, Harare, Zimbabwe

Correspondence

Naboth Matinhira, Department of Otolaryngology-Head and Neck Surgery, University of Zimbabwe, 93 Baines Avenue, Cnr 2nd Street, Harare, Zimbabwe.
Email: nabothmatinhira8@gmail.com

Abstract

Objectives: To describe findings from an otolaryngology-specific needs assessment tool in Zimbabwe.

Methods: Surveys were developed and shared with Low-Middle Income Country (LMIC) hosting institutions in Zimbabwe and to High-Income Country surgical trip participants (HIC). Respondents were otolaryngologists identified online and through professional networks who had participated in a surgical trip.

Results: The most common procedures Zimbabwe otolaryngologists reported treating were adenotonsillectomy (85.7%), chronic rhinosinusitis (71.4%), chronic otitis (57.1%), and head and neck tumor intervention (57.1%). The most common untreatable conditions that host physicians wanted to treat were skull base surgery (71.4%), flap reconstructions (57.1%), and laryngotracheal reconstruction (57.1%). The largest discrepancy between host desires and visiting team offerings were flap reconstruction (57.1%), nasal bone deformities (37.1%), and laryngotracheal reconstruction (17.1%). Perceptions of short-term surgical trips (STST) were recorded for host and visiting teams, and important differences between the public and private sectors of care in Zimbabwe were also identified.

Conclusion: The surveys utilized in this study served as a bidirectional needs assessment of the requirements and care goals of host institutions and visiting teams in Zimbabwe. Differences between public and private sectors of care, particularly regarding infrastructure, resources, and surgical goals, were revealed, and the results

Katerina J. Green and Naboth Matinhira are co-first authors.

This research was previously presented as a poster at the Triological Society 2023 Meeting in Coronado, California on January 28, 2023.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2024 The Author(s). *Laryngoscope Investigative Otolaryngology* published by Wiley Periodicals LLC on behalf of The Triological Society.

can be utilized as part of efforts to maximize efforts within global surgical partnerships.

Level of Evidence: VI.

KEYWORDS

bidirectional, global health, global surgery, head and neck surgery, low middle-income country, needs assessment, otolaryngology, short-term surgical trips, sustainability, Zimbabwe

1 | INTRODUCTION

Within global health and global surgery, a paradigm shift is occurring - transitioning from a focus on short-term surgical trips (STSTs), to a future of sustainable surgical care in low- and middle-income countries (LMICs). There are disparities for safe and affordable surgical care in LMICs compared to high-income countries (HICs). Essential surgical care is “any and all procedures, contextually and culturally dependent, that are deemed by that region, society, or culture to promote individual and public health, wellbeing, and economic prosperity.”¹ Surgeons from HICs have attempted to reduce the disparities in LMIC essential surgical care for decades through STSTs, such as mission trips or surgery camps; however, the global need for improved essential surgical care remains. Five billion people are without access to safe surgical and anesthetic care that they require.² This insurmountable need cannot be met by short-term solutions and necessitates creating sustainable global surgery partnerships and development.

Sustainable global partnerships can be fostered through collaborative appraisal of the needs of all involved partners. Surgical workforce gaps in LMICs are often bridged by short-term surgical trips. However, these trips are often criticized for reasons including poor quality of care, lack of follow-up, insufficient knowledge transfers and different ethical dilemmas which can leave visiting and hosting teams unfulfilled from these partnerships.³ A specialty-specific needs assessment is a tool utilized by several surgical subspecialties to foster sustainable global partnerships by facilitating communication about goals, expectations, and anticipated barriers.^{4,5} An otolaryngology-specific needs assessment was developed and implemented in parts of Africa.⁶ In this study, we modified and applied a bidirectional otolaryngology-specific needs assessment to otolaryngologists in Zimbabwe and previous visiting surgeons from HICs including the United States, Denmark, and South Korea. The objective of this study was to identify the educational and material needs of otolaryngologists in Zimbabwe and their HIC partners when collaborating in these partnerships.

2 | MATERIALS AND METHODS

This research study was reviewed by the Mayo Clinic IRB (#20-013276) and determined to be exempt.

2.1 | Setting

Otolaryngologists from academic and community hospitals in the United States and Zimbabwe participated in this study. Although the number of surgeons in Zimbabwe is not widely reported, Makoni estimated that there was one physician for every 12,000 residents as of 2019.⁷ Reduced access to surgical care is further accentuated for rural populations and further compounded by recurring healthcare strikes, poor transport infrastructure, and the COVID-19 pandemic. For specialty surgical teams, such as otolaryngology, the surgeon-to-citizen ratio is even larger. In Zimbabwe, majority of otolaryngologic care occurs in the capital city Harare in one of three government hospitals or the private otolaryngology clinics. There is one otolaryngologist who practices primarily in Bindura, a remote town located 1.5 h by car from Zimbabwe.

2.2 | Survey design

Surveys 1 and 2 were developed based on the literature review, with their full text provided in Appendices 1 and 2. Informed consent was obtained from all survey participants. Survey 1 was distributed to seven host attending surgeons with government and private hospital affiliations. This survey evaluated the following: common procedures performed at host institution, diseases that they were unable to treat, common complications, number of personnel, access to basic services for healthcare (electricity, water, oxygen, internet, and medical records), priorities for surgical techniques needed to be learned, needed surgical equipment, and host institution's collaboration goals.

Survey 2 was administered to the Zimbabwe visiting teams and evaluated the following: team composition, types of communication with host, funding resources and use, common procedures performed, topics of education that were prioritized by the visitors, other non-surgical services provided, materials brought, and the visiting team's collaboration goals. This survey was completed by five attending surgeons, four of which have completed several surgical trips.

Survey 1 respondents were identified via author JW. Survey 2 was administered to otolaryngologists from HICs who have participated in at least one short-term surgical trip, defined as 4 weeks or less. Survey 2 respondents were identified via internet search and personal referral from the LMIC hosts. REDCap surveys were

disseminated via email, which contained an introductory letter and survey link.^{6,7} All respondents were informed that their responses may be used for research purposes and to facilitate connections between HIC and LMIC otolaryngologists with complementary skills and needs.

2.3 | Analysis

Close-ended quantitative questions were tabulated using Microsoft Excel (2022) and analyzed using GraphPad Prism (Version 9; Boston, Massachusetts). All responses were evaluated for thematic groups and manually coded. These groups were first conducted by one team member and checked and revised by one additional member. To compare between LMIC and HIC responses, relative ratios were used to account for the difference in number of survey responses in each group. Zimbabwe groups were stratified by government and private institutions. Respondents were able to skip two, optional, open response questions, which were to provide an opportunity to elaborate on previous answers.

TABLE 1 Patient to staff volume analysis from Survey 1.

| Patient to staff volume | Number (%) (n = 7) |
|---|--------------------|
| Number of ENT patients weekly (N [%]) | |
| >100 | 1 (14.3%) |
| 50–100 | 3 (42.9%) |
| <50 | 3 (42.9%) |
| Personnel available daily (average reported availability) | |
| Otolaryngologists | 3 |
| ENT residents | 1 |
| Operative nurses | 1 |
| Perioperative nurses | 1 |
| Anesthesiologists | 1 |
| ENT operating rooms per day | 1 |
| Radiologists | 0 |
| Oncologists | 0 |
| Pathologists | 0 |

TABLE 2 Likert scale responses on infrastructure availability for otolaryngologists in public hospitals.

| Local utilities available | Never | Rarely | Sometimes | Often | Always |
|--------------------------------|---------|---------|-----------|---------|---------|
| Electricity availability | 0 | 0 | 2 (33%) | 3 (50%) | 1 (17%) |
| Working generator availability | 0 | 0 | 2 (33%) | 3 (50%) | 1 (17%) |
| Water availability | 0 | 1 (17%) | 3 (50%) | 0 | 1 (17%) |
| Oxygen availability | 0 | 0 | 1 (17%) | 3 (50%) | 2 (33%) |
| Lab services availability | 1 (17%) | 1 (17%) | 3 (50%) | 1 (17%) | 0 |
| Internet availability | 5 (83%) | 0 | 1 (17%) | 0 | 0 |
| WIFI connectivity | 5 (83%) | 1 (17%) | 0 | 0 | 0 |
| Hospital records availability | 0 | 0 | 2 (33%) | 1 (17%) | 3 (50%) |
| Patient follow-up | 0 | 1 (17%) | 3 (50%) | 1 (17%) | 1 (17%) |

3 | RESULTS

3.1 | Quantitative results

3.1.1 | Survey 1

Seven otolaryngologists completed survey 1 (Table 1). The response rate was 53.8% (7/13). Respondents corresponded to the government (n = 6) and private hospitals (n = 1). Three out of seven respondents reported an average combined clinical and surgical volume of less than 50 ENT patients per week, three reported 50–100 ENT patients/week, and one reported greater than 100 ENT patients/week. On average, there were three otolaryngologists, one resident, one anesthesiologist, one operating room for otolaryngology-head and neck surgery procedures, one operative nurse, and one perioperative nurse per facility. Most facilities (85.7%, 6/7) did not have radiologists, pathologists, or oncologists available for on-call services.

On average, government and private facilities “frequently” or “always” had electricity, generators, oxygen, and medical record services available (Tables 2 and 3). Private facilities “always” had water, patient follow-up, and laboratory services available, while government facilities reported that those services were “sometimes” available. Private hospitals reported “frequently” or “sometimes” having internet and Wi-Fi usage, while government hospitals reported “never” for those two services.

3.1.2 | Survey 2

Five otolaryngologists from the United States and Canada completed survey 2 (Table 4). The response rate was 38.5% (5/13). Survey questions were optional, and partial surveys were analyzed, leading to variability in response rate. The average number of annual short-term surgical trips to any country among the respondents was 1.51 over the course of 22 years with an average trip time of 2 weeks. All respondents had conducted trips to Zimbabwe at least once, with one having visited 10 times (total n = 18). Other reported trips were to Nicaragua (80), Uganda (1), Ghana (1), Kenya (1), Senegal (1), Rwanda (1), Tanzania (1), and South Africa (2). All responders worked at tertiary care centers during their trips and all had taught or operated in

| Local utilities available | Never | Rarely | Sometimes | Often | Always |
|--------------------------------|-------|--------|-----------|----------|----------|
| Electricity availability | 0 | 0 | 0 | 1 (100%) | 0 |
| Working generator availability | 0 | 0 | 0 | 0 | 1 (100%) |
| Water availability | 0 | 0 | 0 | 0 | 1 (100%) |
| Oxygen availability | 0 | 0 | 0 | 0 | 1 (100%) |
| Lab services availability | 0 | 0 | 0 | 0 | 1 (100%) |
| Internet availability | 0 | 0 | 0 | 0 | 1 (100%) |
| WIFI connectivity | 0 | 0 | 0 | 0 | 1 (100%) |
| Hospital records availability | 0 | 0 | 0 | 0 | 1 (100%) |
| Patient follow-up | 0 | 0 | 0 | 0 | 1 (100%) |

TABLE 3 Likert scale responses on infrastructure availability for otolaryngologists in private practice.

both government and private hospitals. The majority traveled alone (4/5) with one respondent traveling with three other otolaryngologists. The majority (3/5) of respondents partially or fully self-fund their short-term surgical trips and most do not receive funding from local communities (4/5). All respondents conducted didactical and technical skills education, while 60% (3/5) also taught intraoperative surgical techniques and 40% (2/5) conducted simulation studies.

Three of five otolaryngologists reported performing a needs assessment (60%), and none trained for cultural competency. All communicated with hosts through email, and 80% used WhatsApp. The majority identified training/skills improvement and increased local sustainability as the focus of their surgical trip, and only one respondent identified research as one of their top three goals.

3.2 | Qualitative results

Procedures currently performed by Zimbabwe surgeons and those they desire to perform were compared to procedures offered by visiting institutions (Figure 1). The four most common procedures Zimbabwe otolaryngologists reported performing were adenotonsillectomy (85.7%), chronic rhinosinusitis (71.4%), chronic otitis (57.1%), and head and neck tumor intervention (57.1%). The three most common untreatable conditions that host physicians wanted to treat were skull base surgery (71.4%), flap reconstructions (57.1%), and laryngotracheal reconstruction (57.1%).

The top procedures offered during short-term surgical trips include laryngotracheal reconstruction (40%), nasal bone deformity (20%), skull base (20%), cholesteatoma (20%), mastoidectomy (20%), cochlear implant (20%), and thyroid surgery (20%). The largest discrepancy between host desires and visiting team offerings were flap reconstruction (57.1%), nasal bone deformities (37.1%), and laryngotracheal reconstruction (17.1%).

Surgical trips offered didactic education for host country physicians, trainees, and other health professionals. A majority (57.1%) of Zimbabwe physicians desired to review or learn skills for rhinoplasty, tympanomastoidectomy, head and neck reconstruction, laryngotracheal reconstruction, and vocal cord lateralization/medialization. The top educational topics taught by visitors include endoscopic sinus surgery (40%), chronic otitis media (40%), and ENT airway emergencies

(40%) (Figure 2). The largest differences between educational LMIC desires and HIC offerings were tympanomastoidectomy, head and neck reconstruction, laryngotracheal reconstruction, and vocal cord lateralization/medialization (57.1%).

Among Zimbabwe hosts, the top supply needs were flexible laryngoscopes (71.4%), mastoid drills (57.1%), balloon dilators (42.9%), and endoscopes (42.9%). HICs, on average, provided endoscopes (40%), mastoid drills (20%), endoscopic sinus surgery sets (20%), operating microscopes (20%), and flexible laryngoscopes (20%). The greatest difference in needs and donations was for flexible laryngoscopes and mastoid drills.

Perceptions of STST were recorded for host and visiting teams. Zimbabwean surgeons believed that the trips were “well organized with local contacts,” but lack of equipment, time, ICU support, and hesitance from local surgeons who were “not enthusiastic about fly-in short-term help from savior doctors” provided challenges to the trips. Visiting surgeons believed that STSTs allowed for significant improvement of “[their] teaching/training program and also benefited patients,” but pointed to the lack of sustainability, personnel, and equipment as major challenges.

4 | DISCUSSION

This study aimed to create a bidirectional needs assessment detailing the requirements of current LMIC otolaryngologists in Zimbabwe and visiting HIC otolaryngologists from the United States and Canada. This was a LMIC-centered capacity and needs assessment. The perceived resources and capacity of government hospitals was far below private hospitals; access to basic infrastructure was cited as a limitation to improvement. While both government and private facilities always or frequently had oxygen, generators, and medical record services, public government facilities never had access to internet or Wi-Fi usage. Zimbabwe has one of the highest rates of private health insurance, suggesting its increasing reliance on access to private hospitals.⁸

A discussion of the inequities of Zimbabwe's private-public facilities warrants acknowledgment of the internal political and economic factors that can play a role in the propagation of effective public healthcare. The country has navigated several public health crises,

TABLE 4 Respondent characteristics from Survey 2.

| Respondent characteristics (N [%]) | |
|--|----------|
| <i>Specialty</i> | |
| Laryngology | 2 (40%) |
| Rhinology | 1 (20%) |
| Neurotology | 1 (20%) |
| Pediatrics | 1 (20%) |
| <i>Visiting trip characteristics</i> | |
| Average annual frequency | 1.51 |
| Average length (weeks) | 2 |
| <i>Average visiting team composition</i> | |
| Other otolaryngologists | 1 (20%) |
| Anesthesiologists | 0 (0%) |
| Perioperative nurses | 0 (0%) |
| Non-perioperative nurses | 0 (0%) |
| ENT residents | 0 (0%) |
| Administrative staff | 0 (0%) |
| <i>Pre-trip preparation</i> | |
| Local medical licensed | 0 (0%) |
| Conducted a needs assessment | 3 (60%) |
| Cultural competency training | 0 (0%) |
| <i>Funding</i> | |
| Home institution grant | 2 (40%) |
| Outside institution grant | 1 (20%) |
| Self-funded | 3 (60%) |
| Fundraising | 2 (40%) |
| Local community | 1 (20%) |
| <i>Purpose of funding</i> | |
| Salaries for visiting team | 0 (0%) |
| Supplies and equipment | 3 (60%) |
| Transportation | 5 (100%) |
| <i>Education provided</i> | |
| Clinical education | 5 (100%) |
| Technical skills | 5 (100%) |
| Intraoperative surgical skills | 3 (60%) |
| Simulation studies | 2 (40%) |
| <i>Host communication</i> | |
| Email | 5 (100%) |
| WhatsApp | 4 (80%) |
| Phone call | 2 (40%) |
| Video meeting | 1 (20%) |

such as the HIV/AIDS and cholera epidemics, in the midst of an economic collapse aggravated by economic collapse and reduced health-care funding.⁸ Most recently, the strain on capacity of public health facilities was seen in the context of the COVID pandemic, where deficiencies in bed space, PPE, and staff engendered issues in Zimbabwe's response efforts, mirroring challenges seen globally in HICs and LMICs

alike.⁹ While there have been pushes toward establishing effective public health policy through the Ministry of Health, reinvigorating public institutions and adequately supporting public healthcare professionals will require extensive investment from both public and private stakeholders.¹⁰ Until then, disparities will remain between public and private hospitals and those able to afford health services will most likely continue to utilize better equipped private facilities.¹¹

The capacity of private hospitals was starkly different from the public hospitals in our assessment. Majority of otolaryngology practitioners in Zimbabwe do both private and public work, practicing in both types of facilities. It was notable that each of the government, public hospitals had a fewer number of Otolaryngologists as faculty in their hospital (average of 2 Otolaryngologists) than the private hospital which had 7 Otolaryngologists who practiced there. Despite these differences, each facility saw an average of 50–100 ENT patients weekly. It was notable that the material needs between the private and public hospitals was vastly different. This suggests that approaches to private and public hospital STSTs should be carefully considered, understanding the needs, capacity, and funding of all stakeholders involved.

Visiting and host surgeons both aspired to expand the surgical capacity of LMIC, prioritize education, and improve local sustainability. A salient finding of this study was the unmet need for advanced surgical training for skull base surgery, flap reconstruction, and laryngotracheal reconstruction. This could be due to the lack of time for education as well as the rigorous and intensive nature of these surgeries. Nasal bone deformities and sinonasal tumor related surgeries were also requested skills, yet were unmet by the visiting HIC surgeons. Some LMIC otolaryngologists noted that some HIC groups performed surgeries that were already performed by the host groups, such as obstructive sleep/disordered breathing, airway emergencies, and foreign body removals. This could suggest an inefficient use of time, resources and STSTs. Due to lack of post-operative outcomes data, it is unclear if procedures deemed no longer needed from visiting STSTs are indeed already mastered by the local teams. This is an important data set to be considered when planning changes in training opportunities.

Our study highlights the educational differences between the visiting HIC groups and host groups. LMIC host groups prioritized head and neck reconstruction, laryngotracheal reconstruction, vocal cord lateralization/medialization, tympanomastoidectomy, and rhinoplasty, whereas visiting groups focused on ENT airway emergencies and endoscopic sinus surgeries, similar to the aforementioned surgical focus. This highlights the importance of a needs assessment to ensure visiting groups are utilizing their educational resources efficiently and effectively.

This study also emphasizes the differing expectations regarding education, surgical procedures, and research participation. The perceptions of host and visitor experiences with STSTs in Zimbabwe reflected the challenges with creating sustainability due to inherent difficulties of inadequate resources, time, and continuity. The use of a bidirectional needs assessment prior to travel can mitigate differences in expectations and allow both groups to create a more effective

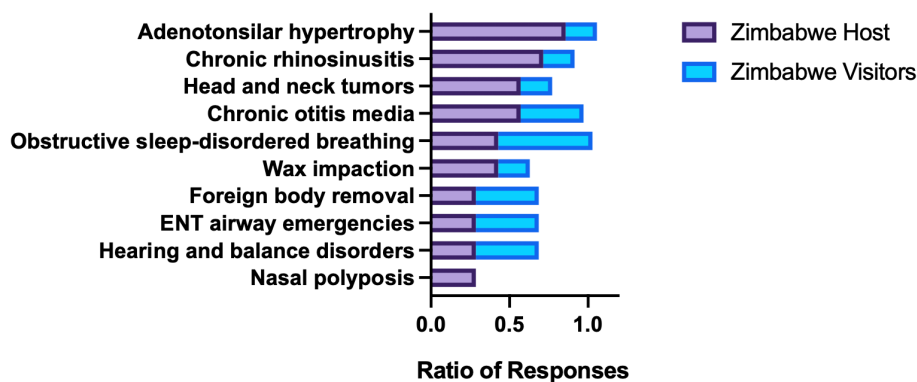


FIGURE 1 ENT procedures performed by host and visiting teams.

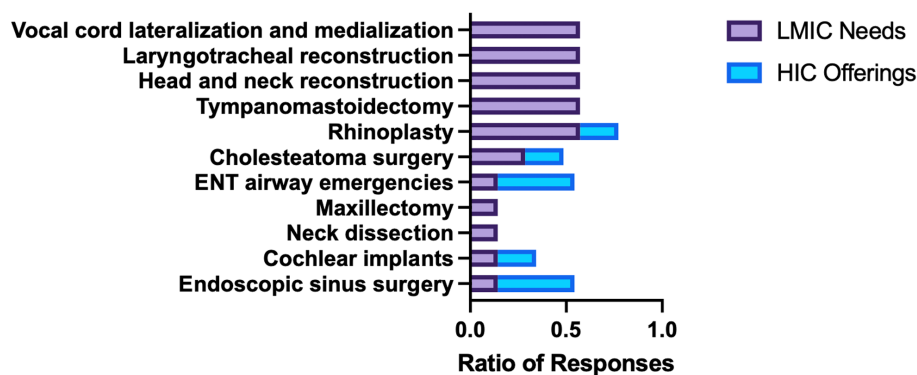


FIGURE 2 Prioritized teaching subjects by host and visiting teams.

STST. National surgical societies, such as the American College of Surgeons, have started providing formal and informal networks for institutions supporting global surgical training partnerships, which can better facilitate STSTs.¹² Global neurosurgery literature cites the effectiveness of equipment donation incorporated with directed skills transfer, which has not been utilized in otolaryngology STSTs and would further surgical training.¹³ Many LMICs note that direct monetary donations are not beneficial but rather specific equipment, medications, and operative instruments are imperative to long-term systemic improvement.¹⁴ Careful consideration of private or public facilities should be factored into STST planning as the education and material needs of facilities are shown to differ greatly.

There are important limitations to this study that must be considered when interpreting the results. The otolaryngologist responses within the results of this study are not representative of all physicians in both host and visiting teams, and the surveys did not have a complete response rate. It is recommended that physicians pursuing such trips conduct their own needs assessment within the context of the specialty and region they are visiting in order to understand the goals, necessities, strengths, and challenges of care within that area. The results within this study have opportunity for further refinement and validation through future work, and ultimately have potential to serve as one tool of many in the efforts to optimize partnerships in global surgery.

The current study presents many areas to expand and elaborate on what is known and published on from the patient population and otolaryngology surgical experience in Zimbabwe. This study has

informed future studies that look to determine the current surgical capacity of ENT in Zimbabwe and how that is evolving over time, as well as what barriers patients and providers are facing to receive or provide appropriate otolaryngology care through utilization of a 3-delay model. The 3-delay model is a validated tool used to study sources of delays to receiving appropriate medical care. Applications of the 3-delay model in LMICs have been used to identify and address delays to patients recognizing treatable health concerns, delays in reaching appropriate care facilities, and further delays in receiving care after reaching the appropriate facility. Results of this study reveals areas of need identified by Otolaryngologist's perspectives. The results of the 3-delay study will illuminate the needs and barriers for patients who need otolaryngologic care.

5 | CONCLUSION

Currently, no otolaryngology-specific needs assessment for Zimbabwe exists published in the literature. Our team utilized surveys as a tool to assess the requirements, resources, and care goals of host institutions and physicians and visiting teams in Zimbabwe in order to maximize positive outcomes of global surgical partnerships. Implementation of this bidirectional needs assessment tool with HIC and LMIC otolaryngologists participating in surgical trips in Zimbabwe revealed differences between the public and private sectors of care, particularly regarding infrastructure, resources, and surgical goals.

ACKNOWLEDGMENTS

We would like to thank and acknowledge all Zimbabwean and visiting Otolaryngologists who completed our survey and made this study possible. From Zimbabwe; Dr. Memory Bara, MB ChB, Dr. Zororo Mataruse, MB ChB, Dr. Cameline Nyamarebv, MB ChB, and Dr. Masiye Mlambo, MC ChB.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ORCID

Katerina J. Green  <https://orcid.org/0000-0001-5937-4822>

Priya Arya  <https://orcid.org/0000-0002-6423-6165>

REFERENCES

- Meara JG, Leather AJM, Hagander L, et al. Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386(9993):569-624. doi:10.1016/S0140-6736(15)60160-X
- Reddy CL, Vervoort D, Meara JG, Atun R. Surgery and universal health coverage: designing an essential package for surgical care expansion and scale-up. *J Glob Health*. 2020;10(2):020341. doi:10.7189/jogh.10.02034
- Velin L, Lantz A, Ameh EA, et al. Systematic review of low-income and middle-income country perceptions of visiting surgical teams from high-income countries. *BMJ Glob Health*. 2022;7(4):e008791. doi:10.1136/bmjgh-2022-008791
- Bhashyam AR, Fils J, Lowell J, Meara JG, Dyer GSM. A novel approach for needs assessment to build global orthopedic surgical capacity in a low-income country. *J Surg Educ*. 2015;72(4):e2-e8. doi:10.1016/j.jsurg.2014.10.008
- Shapiro LM, Park MO, Mariano DJ, Kamal RN. Development of a needs assessment tool to promote capacity building in hand surgery outreach trips: a methodological triangulation approach. *J Hand Surg Am*. 2020;45(8):729-737.e1. doi:10.1016/j.jhsa.2020.04.014
- Chweya CM, Ryder CY, Fei-Zhang DJ, et al. Bidirectional needs assessment of otolaryngology-head and neck surgery short-term surgical trips to Ethiopia and Kenya. *Laryngosc Investig Oto*. 2023;8(1):303-312. doi:10.1002/lio2.1014
- Makoni M. Doctor strikes in Zimbabwe: fighting for provision of health. *Lancet*. 2019;393:10170. doi:10.1016/S0140-6736(19)30198-9
- Mhazo AT, Maponga CC, Mossialos E. Inequality and private health insurance in Zimbabwe: history, politics and performance. *Int J Equity Health*. 2023;22(1):1-13. doi:10.1186/s12939-023-01868-9
- Mugwagwa JT. Private sector participation in health care in Zimbabwe: What's the value-added? *J Healthc Commun*. 2017;2(2):1-8. doi:10.4172/2472-1654.100050
- Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform*. 2019;95:1-8. doi:10.1016/j.jbi.2019.103208
- Kidia KK. The future of health in Zimbabwe. *Glob Health Action*. 2018;11(1):1496888. doi:10.1080/16549716.2018.1496888
- Murewanhema G. Public health sector capacity and resilience building in Zimbabwe: an urgent priority as further waves of COVID-19 are imminent. *S Afr Med J*. 2022;112:249-250. doi:10.7196/SAMJ.2022.v112i4.16080
- Rickard J, Ntirenganya F, Ntakiyiruta G, Chu K. Global Health in the 21st century: equity in surgical training partnerships. *J Surg Educ*. 2019;76(1):9-13. doi:10.1016/j.jsurg.2018.07.010
- Zeng W, Lannes L, Mutasa R. Utilization of health care and burden of out-of-pocket health expenditure in Zimbabwe: results from a National Household Survey. *Health Syst Reform*. 2018;4(4):300-312. doi:10.1080/23288604.2018.1513264

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Green KJ, Matinhira N, Jain A, et al. Bidirectional needs assessment of otolaryngology-head and neck surgery short-term surgical trips in Zimbabwe. *Laryngoscope Investigative Otolaryngology*. 2024;9(3):e1278. doi:10.1002/lio2.1278