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Global Surgery: Building Healthy Surgical Systems

Taylor Leposa,¹ Bria Johnston,² Sohail Dogar,³ Henry Rice,⁴ Tamara Fitzgerald⁵

Abstract

Global Surgery (GS) is a movement that advocates access of every individual to safe and affordable surgery despite geographic location or socioeconomic status. It has recently received increased attention within the global health arena, but many patients are still without access to care because of geographical, social and economic disparities. Due to the multi-disciplinary nature of surgical services, GS requires that a worldwide network of healthy surgical systems be developed and sustained. Healthy surgical systems have many components, and this paper will briefly address 3 of those components: Improved access to care, safety and quality, and multidisciplinary strengthening.

Keywords: Global surgery, Healthcare disparities, Surgical safety, Surgical systems, Access to care.

Introduction

Global Surgery (GS) is a movement that advocates access to safe and affordable surgery for every individual regardless of geographical location or socioeconomic status. Historically, surgery has been the focus of medical missions in many parts of the world or largely ignored because it was thought to be too complicated and expensive to implement on a wide scale in challenging areas. GS has recently received increased attention due to the Lancet Commission on Global Surgery,¹ and the inclusion of surgical services in the Sustainable Development Goals (SDGs) of the United Nations.² Therefore it is emerging as a topic of discussion with increasing emphasis.

If all people are to have access to safe and affordable surgery, then a worldwide network of healthy surgical systems will be required. In both high-income countries (HICs) and low- and middle-income countries (LMICs) there are diverse challenges to providing safe and affordable surgery. Healthy surgical systems have many

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components, and the current paper was planned to briefly address three of them: improved access to care, safety and quality, and multidisciplinary strengthening.

Improved Access to Care

A surgical system is only effective to patients when it is accessible, and in many parts of the world significant obstacles still exist. Barriers to surgical care have been described in a 3-delay model: delay in seeking care, delay in reaching care, and delay in receiving care.³ Patients may delay seeking care due to geographical distance to the nearest healthcare facility, fears regarding the expense of treatment, lack of education or trust in traditional healers. Delays in reaching care are mainly attributed to geographical distances and lack of reliable and affordable transportation. Delays in receiving care occur when the nearest hospital does not provide the services that the patient needs, or the hospital is simply overwhelmed with the backlog of pending surgical cases and cannot accommodate new patients.¹

In many countries, there are limited numbers of healthcare facilities, often concentrated in urban areas, while large numbers of the population live in rural areas. Lack of reliable transportation, harsh terrains, and poor travel infrastructure create geographical barriers.⁴ This geographical separation between patients and healthcare facilities has been documented in diverse regions of the world, such as communities in Mexico where individuals must travel an average of 30km to reach the nearest health facility⁵ or in Ethiopia where individuals must travel 15-18km on foot before reaching a town that offers motorised transport to the nearest medical facility.⁶ In HICs as well, many patients in rural areas struggle with access to care compared to those in urban areas.⁷ More tragic is that reaching the nearest facility does not always ensure that it will have the equipment, supplies or physicians that patients require.³

It is not uncommon that traditional healers are easily accessible in many communities and patients may receive societal and religious pressure to seek these healers primarily.⁸ Due to the combination of these obstacles, individuals may allow an illness to advance significantly

before deeming that it is necessary to overcome the challenges of travel to a medical facility.⁹

In addition to the physical burden of travelling these extreme routes, many individuals must consider the financial costs of travel and healthcare.⁴ The Lancet Commission estimated that 33 million individuals face catastrophic expenses from the cost of surgical procedures alone and another 48 million face catastrophic expenses from non-medical costs directly related to receiving the necessary treatment.¹ Although many government hospitals provide 'free care', other essential services are often not provided. These may include radiological studies, certain medications and nutrition.¹⁰ In addition, many families must travel with their dependents and then cannot afford food or accommodations for these members.¹¹ Delays in seeking care may result in progression of disease, resulting in a requirement for more urgent, risky and expensive procedures. This contributes to a cycle which further intensifies obstacles and increases delays.

Often the healthcare facility most accessible to the patient may not have the adequate resources, materials or skilled physicians. This results in referral to a private hospital or a more distant hospital. Because of the frequency of these situations, larger hospitals often have tremendous backlogs and can be overcrowded up to 200-300% of maximum capacity.¹² Consequently, the lack of essential resources and extensive wait periods contribute to a lack of trust in these hospitals' ability to care for them. The challenge of distrust can stem from both traditional beliefs and situational encounters. Many communities have limited experience with modern healthcare options, which may be perceived as foreign and threatening.¹³ For example, in parts of the world, it is a widely held belief that obstructed labour occurs as a consequence of infidelity. It is expected that if the woman in labour admits to the infidelity, then childbirth will proceed as it should, and intervention from modern medicine would neither be required nor preferred.^{3,6,14} The need for surgical intervention can also be perceived as weakness and some may fear that anaesthesia results in death. Surgical procedures have been perceived to result in a patient being 'half-human' and minor procedures could lead to an individual being regarded as less than whole, resulting in stigmatisation.¹⁵ When patients encounter healthcare facilities, and these facilities do not possess the resources to provide safe

and timely care, it can further propagate distrust in the medical system. Additionally, visiting teams from HICs, while well-intentioned, can result in a perception of lack of quality and distrust in the country's own more permanent healthcare systems, creating a vacuum of care when these teams leave.¹⁶

Safety and quality

It is essential that as surgical systems develop, they be built upon a foundation of quality and safety, which in turn inspires trust. A culture of safety must be valued and implemented over time to minimise post-operative complications (POCs) and infections. In particular, POCs have lasting economic consequences through lost days of work and higher healthcare costs, all of which contribute to poverty.¹⁷ For children, the burden of POCs contributes to decreased school attendance and poor quality of life.¹⁸ The implementation of comprehensive programmes to control POCs and infections, and address other patient safety challenges are critical to ensure that surgery can be provided at low risk.

Many factors contribute to the high burden of POCs, including limited healthcare infrastructure, inadequate surveillance tools, lack of trained personnel, and inadequate infection control programmes. In LMICs, the prevalence of hospital-acquired infections may be as high as 25%, which adds billions of dollars annually to already struggling healthcare systems.¹⁹ Critical needs include POC reporting systems, understanding of the epidemiology of POCs, programmes to improve the safety culture, and tools to control infection. Building clinical and research capacity in patient safety is essential to develop effective interventions that are tailored to local context and implementation challenges.

Challenges to the reduction of POCs include addressing many social determinants of health, including complex cultural, social, environmental and political challenges.²⁰ Despite the high burden of POCs in LMICs, there is a lack of high-quality data on the epidemiology of POCs as well as tools to reduce the risk. In many healthcare facilities, there is a lack of functional surveillance programmes as well as of personnel trained in infection control and health research infrastructure.²¹ Concerns about patient safety have driven the dissemination of tools to improve patient safety, such as pre-procedural checklists²² or programmes to improve clinical bacteriology.²³ However, sustained implementation of

individual programmes to control POCs and improve patient safety are often unsuccessful, with barriers including high costs, lack of research capacity, and limited human resources.^{19,20,23,24}

Studies have highlighted the need for training of local interdisciplinary teams of experts in patient safety, such that these stakeholders can drive the implementation of programmes to reduce POCs within a local context.²⁴ Training programmes should emphasise the value of improving a hospital's organisational functioning as a first step to improving patient safety. Fundamental is the belief that most errors in healthcare are the result of a breakdown in systems rather than the fault of individuals. A 'Just Culture' is a learning environment that is constantly improving and is characterised by accountability and error identification.²⁵ In 'To Err Is Human', the US National Academy of Medicine highlights the importance of building a safety culture as a prerequisite to improving healthcare safety and quality.²⁶ Through a focus on defects attributable to system design as the root cause of medical harm, safety science has moved from a focus on individuals to contextual factors. This 'system approach' proposes that healthcare systems require safeguards to mitigate human error.²⁷ A growing body of literature from HICs has shown that modification of the safety culture can improve patient outcomes and organisational performance.²⁸⁻³⁰

Effective leadership is necessary to build interdisciplinary teams to address quality and patient safety.³¹ "The role of leadership is to establish the value system in the organisation; set strategic goals for activities to be undertaken; align efforts within the organisation to achieve those goals ... When leaders begin to change their responses to mistakes and failure, asking what happened instead of who made the error, the culture within their institutions will begin to change."³²

Leadership must be cultivated at the local and national levels. In addition to managing technically-challenging cases, surgeons must often play a role in hospital decision-making, communication, teamwork across disciplines and stress management.³³ These roles are often intensified and more challenging in resource-constrained environments where adequate numbers of leadership positions may be lacking and surgeons are called upon to fulfill these roles in addition to their clinical responsibilities. Therefore, it is necessary to prioritise leadership skills and training, as positive

organisational leadership has been shown to mitigate physician burnout and improve job satisfaction.³⁴

Multidisciplinary strengthening

To improve the quality and safety of surgical care, there must be strengthening at a multidisciplinary level.³⁵ In some locations, there are significant shortages in healthcare workers,³⁶ while in other locations these healthcare workers may be present in adequate numbers, but may lack physical resources, mentorship or further training.³⁷ Surgery has always been a team effort, and it is easy to understand that surgery cannot be performed without the participation of other disciplines such as anaesthesia and peri-operative nursing care.³⁸ For example, critical care physicians and nurses are essential to improve outcomes after emergency surgery for trauma, intra-abdominal catastrophes, septic events and any surgery requiring post-operative continued ventilatory or haemodynamic support.³⁹ Neonatologists are essential in the peri-operative care of infants and neonates.⁴⁰ Diseases such as biliary atresia involve coordination between paediatric surgery, hepatology and transplant surgery, and efforts such as internet-based communication platforms have been proposed to increase collaborations across HIC institutions.⁴¹ Multidisciplinary care for cancer involves treatment coordination by oncologists, surgeons, radiation oncologists, radiologists, pathologists and others.^{42,43} Multidisciplinary cancer meetings are rapidly emerging in LMICs and many of these efforts are resulting in improved outcomes.⁴⁴ Emergency medical services, such as ambulances and emergency medical technicians, have been shown to be crucial to trauma care. In fact, increasing the number of surgeons does not reduce mortality from road traffic accidents (RTAs) unless these other essential emergency medical services are also increased.⁴⁵ The treatments we can offer to patients have increasingly become more precise and complex, and they require a diversity of expertise. It is not beneficial to patient care or healthy for physicians to work in isolation. If GS is to succeed, then there must be a strengthening across the entire healthcare system.

Conclusion

Global Surgery is gaining increasing consideration and support, yet there is much work to be done. Many patients globally are still without access to care because of

geographical, social and economic disparities. Now more than ever, leaders are needed within our healthcare systems and government structures to champion the cause of increasing our standards in safety and quality of care. This will require teamwork and interdisciplinary collaboration. The idea that all individuals should be able to access safe and affordable surgery is a lofty yet achievable goal for us all.

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References

- Meara JG, Leather AJ, Hagander L, Alkire BC, Alonso N, Ameh EA, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet* 2015;386:569-624.
- United Nations. Transforming our world: the 2030 agenda for sustainable development. [Internet] 2015 [cited 2018 October 3] Available from: <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>
- Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med* 1994;38:1091-110.
- Grimes CE, Bowman KG, Dodgion CM, Lavy CB. Systematic review of barriers to surgical care in low-income and middle-income countries. *World J Surg* 2011;35:941-50.
- Young JC, Garro LY. Variation in the choice of treatment in two Mexican communities. *Soc Sci Med* 1982;16:1453-65.
- Kloos H, Etea A, Degefa A, Aga H, Solomon B, Abera K, et al. Illness and health behaviour in Addis Ababa and rural central Ethiopia. *Soc Sci Med* 1987;25:1003-19.
- Kirby JB, Muhuri P. Statistical brief #512: Insurance and access to care in urban and rural areas, 2014-2015. In: Statistical Brief (Medical Expenditure Panel Survey (US)) [Internet] Rockville, MD: Agency for Healthcare Research and Quality (US); 2001 [cited 2018 September 7] Available from: <https://www.ncbi.nlm.nih.gov/books/NBK500455/>
- Innocent E. Trends and challenges toward integration of traditional medicine in formal health-care system: historical perspectives and appraisal of education curricula in Sub-Saharan Africa. *J Intersect Ethnopharmacol* 2016;5:312-6.
- Rahaman MM, Aziz KM, Munshi MH, Patwari Y, Rahman M. A diarrhea clinic in rural Bangladesh: influence of distance, age, and sex on attendance and diarrheal mortality. *Am J Public Health* 1982;72:1124-8.
- Muzira A, Kakembo N, Kisa P, Langer M, Sekabira J, Ozgediz D, et al. The socioeconomic impact of a pediatric ostomy in Uganda: a pilot study. *Pediatr Surg Int* 2018;34:457-66.
- Lasker JN. Choosing among therapies: illness behavior in the Ivory Coast. *Soc Sci Med Med Psychol Med Sociol* 1981;15A:157-68.
- Holmberg S, Rothstein B. Dying of corruption. *Health Econ Policy Law* 2011;6:529-47.
- Aamodt AM. Observations of a health and healing system in a Papago community. *Health Care Dimen* 1976;3:23-36.
- Zola IK. Culture and symptoms - an analysis of patients' presenting complaints. *Am Sociol Rev* 1966;31:615-30.
- Groen RS, Sriram VM, Kamara TB, Kushner AL, Blok L. Individual and community perceptions of surgical care in Sierra Leone. *Trop Med Int Health* 2014;19:107-16.
- Mussa AH, Pfeiffer J, Gloyd SS, Sherr K. Vertical funding, non-governmental organizations, and health system strengthening: perspectives of public sector health workers in Mozambique. *Hum Resour Health* 2013;11:26. doi: 10.1186/1478-4491-11-26.
- Peters DH, Garg A, Bloom G, Walker DG, Brieger WR, Rahman MH. Poverty and access to health care in developing countries. *Ann N Y Acad Sci* 2008;1136:161-71.
- O'Donnell O. Access to health care in developing countries: breaking down demand side barriers. *Cad Saude Publica* 2007;23:2820-34.
- Bardossy AC, Zervos J, Zervos M. Preventing hospital-acquired infections in low-income and middle-income countries: impact, gaps, and opportunities. *Infect Dis Clin North Am* 2016;30:805-18.
- Bates DW, Larizgoitia I, Prasopa-Plaizier N, Jha AK, Research Priority Setting Working Group of the WHO World Alliance for Patient Safety. Global priorities for patient safety research. *BMJ* 2009;338:b1775. doi: 10.1136/bmj.b1775.
- Vilar-Compte D, Camacho-Ortiz A, Ponce-de-Leon S. Infection control in limited resources countries: challenges and priorities. *Curr Infect Dis Rep* 2017;19:20. doi: 10.1007/s11908-017-0572-y.
- Haynes AB, Weiser TG, Berry WR, Lipsitz SR, Breizat AH, Dellinger EP, et al. A surgical safety checklist to reduce morbidity and mortality in a global population. *N Engl J Med* 2009;360:491-9.
- Ombelet S, Ronat JB, Walsh T, Yansouni CP, Cox J, Vlieghe E, et al. Clinical bacteriology in low-resource settings: today's solutions. *Lancet Infect Dis* 2018;18:e248-e258. doi: 10.1016/S1473-3099(18)30093-8.
- Rice HE, Lou-Meda R, Saxton AT, Johnston BE, Ramirez CC, Mendez S, et al. Building a safety culture in global health: lessons from Guatemala. *BMJ Glob Health* 2018;3:e000630. doi: 10.1136/bmjgh-2017-000630.
- Boysen PG 2nd. Just culture: a foundation for balanced accountability and patient safety. *Ochsner J* 2013;13:400-6.
- Institute of Medicine Committee on Quality of Health Care in America; Kohn LT, Corrigan JM, Donaldson MS, editors. *To err is human: building a safer health system*. Washington, DC: National Academies Press; 2000. doi: 10.17226/9728
- Reason J. Human error: models and management. *BMJ* 2000;320:768-70.
- Fan CJ, Pawlik TM, Daniels T, Vernon N, Banks K, Westby P, et al. Association of safety culture with surgical site infection outcomes. *J Am Coll Surg* 2016;222:122-8.
- Profit J, Sharek PJ, Kan P, Rigdon J, Desai M, Nisbet CC, et al. Teamwork in the NICU setting and its association with health care-associated infections in very low-birth-weight infants. *Am J Perinatol* 2017;34:1032-40.
- Wakefield JG, McLaws ML, Whitby M, Patton L. Patient safety culture: factors that influence clinician involvement in patient safety behaviours. *Qual Saf Health Care* 2010;19:585-91.
- Grumbach K, Bainbridge E, Bodenheimer T. Facilitating improvement in primary care: the promise of practice coaching. *Issue Brief (Commonw Fund)* 2012;15:1-14.
- Ritchie MJ, Parker LE, Edlund CN, Kirchner JE. Using implementation facilitation to foster clinical practice quality and adherence to evidence in challenged settings: a qualitative study. *BMC Health Serv Res* 2017;17:294. doi: 10.1186/s12913-017-2217-0.
- Scott J, Revera Morales D, McRitchie A, Riviello R, Smink D, Yule S. Non-technical skills and health care provision in low- and middle-income countries: a systematic review. *Med Educ*. 2016 Apr;50(4):441-55.
- Shanafelt TD, Gorringer G, Menaker R, Storz KA, Reeves D, Buskirk SJ, et al. Impact of organizational leadership on physician burnout and satisfaction. *Mayo Clin Proc* 2015;90:432-40.
- Holmer H, Shrimme MG, Riesel JN, Meara JG, Hagander L. Towards closing the gap of the global surgeon, anaesthesiologist, and

- obstetrician workforce: thresholds and projections towards 2030. *Lancet* 2015;385(Suppl 2):S40. doi: 10.1016/S0140-6736(15)60835-2.
36. Nobakht S, Shirdel A, Molavi-Taleghani Y, Doustmohammadi MM, Sheikhbardsiri H. Human resources for health: a narrative review of adequacy and distribution of clinical and nonclinical human resources in hospitals of Iran. *Int J Health Plann Manage* 2018;33:560-72.
 37. Hickerson KA, Agosto PM, Cieplinski JA, Hutchins L, Squires L, Tsarouhas N. A transparent tracking system for competency-based orientation: one children's hospital transport unit experience. *J Nurses Prof Dev* 2018;34:173-7.
 38. Purnell CA. Operation Smile and the Guwahati Comprehensive Cleft Care Center: multidisciplinary global activism in plastic surgery. *Plast Surg Nurs* 2016;36:180-1.
 39. LeBrun DG, Chackungal S, Chao TE, Knowlton LM, Linden AF, Notrica MR, et al. Prioritizing essential surgery and safe anesthesia for the Post-2015 Development Agenda: operative capacities of 78 district hospitals in 7 low- and middle-income countries. *Surgery* 2014;155:365-73.
 40. Ekenze SO, Modekwe VO, Ajuzieogu OV, Asinobi IO, Sanusi J. Neonatal surgery in a developing country: outcome of co-ordinated interdisciplinary collaboration. *J Paediatr Child Health* 2017;53:976-980.
 41. Petersen C. Biliary atresia: unity in diversity. *Pediatr Surg Int* 2017;33:1255-61.
 42. Paintsil V, David H, Kambugu J, Renner L, Kouya F, Eden T, et al. The Collaborative Wilms Tumour Africa Project; baseline evaluation of Wilms tumour treatment and outcome in eight institutes in sub-Saharan Africa. *Eur J Cancer* 2015;51:84-91.
 43. Rodriguez-Galindo C, Friedrich P, Alcasabas P, Antillon F, Banavali S, Castillo L, et al. Toward the cure of all children with cancer through collaborative efforts: pediatric oncology as a global challenge. *J Clin Oncol* 2015;33:3065-73.
 44. Chaouki W, Mimouni M, Boutayeb S, Hachi H, Errihani H, Benjaafar N. [Evaluation of multidisciplinary team meeting; the example of gynecological mammary cancers in a tertiary referral center in Morocco]. *Bull Cancer* 2017;104:644-651. [French]
 45. Hung YC, Bababekov YJ, Stapleton SM, Mukhopadhyay S, Huang SL, Briggs SM, et al. Reducing road traffic deaths: where should we focus global health initiatives? *J Surg Res* 2018;229:337-44.
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