



Contents lists available at ScienceDirect

## The American Journal of Surgery

journal homepage: [www.americanjournalofsurgery.com](http://www.americanjournalofsurgery.com)

My Thoughts/My Surgical Practice

## Academic global surgery and COVID-19: Turning impediments into opportunities



The COVID-19 pandemic has revealed cracks in the United States (US) healthcare system, laying bare the vulnerabilities of our most at-risk patients.<sup>1</sup> Stories of overwhelmed hospitals, critical resource limitations, and disparate outcomes in African Americans affirm that the US healthcare system is both fallible and frail. Surgeons working in low- and middle-income countries (LMICs) are no strangers to similar public health challenges. Our colleagues in LMIC routinely confront complex medical and surgical issues—perforated typhoid, traumatic fractures and prolonged labor complications—with fewer resources. The burden of surgical disease disproportionately falls on the poorest countries where our surgical colleagues must also navigate the milieu of ever-present endemic diseases (i.e., malaria outbreaks, locust infestation), poverty, and food insecurity. Fewer resources available in the so-called “developing world”, however, do not stop development. Rather, it stimulates innovation. Case in point—in the midst of the COVID-19 pandemic, Senegal, a west African country with nearly 16 million people but just 56 resuscitation beds has developed a COVID-19 test that costs approximately \$1 and has a turnaround time of 10 minutes.<sup>2</sup> This illustration suggests that it is not the resources you have but what you do with them. Indeed, we likely have much to learn from a global perspective.

The last ten years have seen the rise of global surgery as an academic pursuit.<sup>3</sup> Academic medical centers, private citizens, and foundations have started to make financial investments to establish sustainability in the mission of academic global surgery, but the true inclusion of global surgery into the academic surgical core remains in its infancy.<sup>4,5</sup> Still, this burgeoning investment is grounded in a fundamental lesson of global surgery: Surgical disease is a disease of poverty, and the most economically depressed populations have the greatest need for surgical care. Understanding the specific social determinants of health that impact patients is fundamental to improving access to safe and timely surgical care around the globe. To be clear, vulnerable populations exist both globally and locally. As the COVID-19 pandemic has shut borders and economies around the globe, many will look internally to protect our own, and the support of global surgery programs that rely on international travel exchanges may be in jeopardy. Yet, a pandemic also highlights the true interdependence of health around the world, and the impediments to sustaining academic global surgery programs are perhaps also opportunities to better develop and maintain programs that incorporate the competencies of global surgery into a future of collaborative surgical education and innovation.

Poverty and access to surgical care are intrinsically linked to one another. The country where you were born, the financial situation

you were born into, the rurality of your town—all of these factors impact ability to access healthcare and, by extension, essential surgical, obstetric, and trauma services.<sup>6</sup> As the pandemic and policies of strict social distancing spread around the globe, the most susceptible populations lay prey to diseases of poverty. There will no doubt be increased morbidity and mortality from non-COVID related conditions, further exacerbating strain on global healthcare systems and economic dependence of the poorest countries on the wealthiest.<sup>7</sup> In Rwanda, for example, necessary social distancing policies have eliminated options for public transit, such as *motos*, which are the primary transportation mode for individuals of all socioeconomic statuses. Loss of transportation means lack of access to healthcare facilities. We are not immune in the United States as fewer elective surgeries and healthcare visits has led to impending financial devastation for many of our nations' safety-net hospitals and Medicaid providers. Not surprisingly, children, minorities, and other vulnerable populations are disproportionately represented in our Medicaid community.<sup>8</sup>

Academic global surgical initiatives desire to engage colleagues in exploration of meaningful solutions to issues of access and quality. Resources allocated for research and development of essential services for low-income settings have always been limited. Certainly, funding for global surgery was a challenge before the COVID-19 pandemic began. In today's new economic reality, academic departments and hospitals face challenging financial decisions to sustain themselves and their missions. As travel is canceled, we fear that global surgery programs will be first on the chopping block. We submit a call to action for surgeons to build on existing relationships and resources to engage global surgery in a more proactive- and perhaps creative-way during these challenging times. We posit that in the future, these efforts will be even more important, particularly to trainees. Recent research has highlighted the lack of alignment between the availability of experiences and resources in global surgery and the high level of interest amongst students and trainees imbued with a commitment to global health equity.<sup>9</sup> Competencies learned through global health engagement will inform how the next generation of trainees practices medicine, which will be of greater importance in the post-COVID era (if such as era even exists). The current global public health crisis illustrates resource constraints, health inequities and structural disparities in healthcare systems worldwide—leaders of tomorrow need a global view, and so it is particularly important to incorporate an academic global surgery curriculum that includes principles of ethics, health economics, disparities, and varying clinical pathologies. Moreover, building strong healthcare systems

relies on the development of surgical services. And strong health-care systems around the world are necessary to prevent and treat the next pandemic.

Additionally, what can we do moving forward to enhance access to resources for our colleagues around the globe? Does our move to online teaching for students and trainees create an opportunity for a more global classroom that can include our colleagues in LMICs, truly challenging academic departments to partner with an LMIC training program through telehealth? Innovators around the globe have worked to develop locally-sourced personal protective equipment and ventilators, for example. This highlights a renewed opportunity for global partnerships to address surgical problems through collaborative innovation. Innovation to produce technology that can help fight the spread of COVID-19, including low cost ventilators and locally-produced particulate-filtering masks, can be shared with colleagues in any country and can be adjusted to fit available resources. Similarly, curriculums and inexpensive simulation that are developed for medical students and trainees in the US can be shared and adapted for trainees globally.

The looming financial impact of the COVID-19 pandemic on academic surgical departments and hospitals is profound and has significant long-term implications for many research and programmatic endeavors. Let this be a call to action for the development of robust and sustainable academic global surgery initiatives rather than sweeping these fledgling programs under the table. A foundation in global health teaches perseverance, innovative thinking, and hope, which we could all use right now. Let the unprecedented changes we are seeing be an opportunity to better integrate into the global and public health dialogue as surgeons, to drive collaborative innovation and teach our medical students and residents the fundamental interconnectedness of health around the planet.

#### Funding

None.

#### Acknowledgements

The authors would like to acknowledge Dr. Gilbert R Upchurch,

Jr, MD for his critical edits and contributions to this manuscript.

#### References

1. Yancy CW. COVID-19 and African Americans. *JAMA*. 2020. <https://doi.org/10.1001/jama.2020.6548>.
2. Yabi OG. Coronavirus and Africa: In Senegal, Communication and Prevention are the Key Words; 2020. <https://www.institutmontaigne.org/en/blog/coronavirus-and-africa-senegal-communication-and-prevention-are-key-words>. Accessed April 30, 2020.
3. Meara JG, Leather AJ, Hagander L, et al. Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *Lancet*. 2015;386(9993):569–624.
4. Krishnaswami S, Stephens CQ, Yang GP, et al. An academic career in global surgery: a position paper from the society of university surgeons committee on academic global surgery. *Surgery*. 2018;163(4):954–960.
5. Abraham MN, Abraham PJ, Chen H, Hendershot KM. What is global surgery? Identifying misconceptions among health professionals. *Am J Surg*. 2019. <https://doi.org/10.1016/j.amjsurg.2019.11.021>. pii: S0002-9610(19)30736-6. [Epub ahead of print].
6. Shah AA, Zogg CK, Rehman A, et al. Disparate outcomes of global emergency surgery - a matched comparison of patients in developed and under-developed healthcare settings. *Am J Surg*. 2018;215(6):1029–1036.
7. Mobarak AM, Zachary B-H. Poor Countries Need to Think Twice about Social Distancing; 2020. <https://foreignpolicy.com/2020/04/10/poor-countries-social-distancing-coronavirus/>. Accessed April 29, 2020.
8. Wagner J. Streamlining Medicaid Enrollment during COVID-19 Public Health Emergency; 2020. <https://www.cbpp.org/research/health/streamlining-medicaid-enrollment-during-covid-19-public-health-emergency>. Accessed May 2, 2020.
9. Scott EM, Fallah PN, Blitzer DN, et al. Next generation of global surgeons: aligning interest with early access to global surgery education. *J Surg Res*. 2019;240: 219–226.

Allison N. Martin, MD MPH

University of Virginia Department of Surgery, Charlottesville, VA, USA

Robin T. Petroze, MD MPH\*

University of Florida, Division of Pediatric Surgery, Gainesville, FL, USA

\* Corresponding author. Department of Surgery, University of Florida College of Medicine, 1600 SW Archer Road, MSB Room N6-13, PO Box 100119, Gainesville, FL, 32610-0119, USA.  
E-mail address: [robin.petroze@surgery.ufl.edu](mailto:robin.petroze@surgery.ufl.edu) (R.T. Petroze).

9 May 2020