



*The surgical workforce crisis in Africa:*

*A call to action*

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**I**t is hard to imagine a more pressing issue facing the global surgical community than ensuring the training and education of an adequate and equitably distributed surgical workforce. Currently, the World Health Organization (WHO) estimates that there is a global shortage of 4.3 million health workers, with an estimated shortage of 1 million in Africa alone. Africa bears 25 percent of the global burden of disease with only 2 percent of the world's workforce—and an even smaller proportion of this workforce is represented by surgeons.<sup>1</sup> Africa may have less than 1 percent of the number of surgeons in the U.S., despite having three times the population.<sup>2</sup> Furthermore, because of the lack of rigorous data, these figures are merely estimates that may significantly underestimate the gap between the burden of surgical disease and the health workforce to address that need. The world's anesthesiology and nursing workforce is similarly insufficient and maldistributed, contributing to limited access to surgical care and compromising the availability, safety, and quality of perioperative services.<sup>3,4</sup>

The surgical consequences of this limited workforce are readily apparent to clinicians who have volunteered or worked in Africa. Most patients with surgical problems routinely treatable in the U.S. fail to reach a health facility or reach a facility without the capacity—either in staff or infrastructure—to care for their problems. The consequence is unparalleled morbidity and mortality that is unfathomable to clinicians who have not worked in these settings. As surgeons in an increasingly interconnected world, we must be aware of the complex factors affecting the overall global health workforce and, specifically, our potential role to improve its quantity and equitable distribution. Nonetheless, there currently seems to be relatively little individual or concerted action on the part of developed countries to tackle this problem in a coordinated, robust, and thoughtful manner.

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Opposite: There is a limited supply of physicians in Africa, and most do not choose a career in surgical and perioperative disciplines for a multitude of reasons. Jane Fualal, MD, MMed (Surgery) (right), a senior faculty general and endocrine surgeon at Makerere University, Uganda, teaches senior medical students in the outpatient surgical clinic. The two medical schools in Uganda produce a combined total of 140 medical students each year. (Photo by Dr. Ozgediz.)

### **Global forum**

These issues were the focus of the first Global Forum on Human Resources for Health in Kampala, Uganda, which convened in March. The forum was hosted by the Global Health Workforce Alliance, a group formed by WHO to tackle the current crisis in human resources for health. During the meeting, the “Kampala Declaration” was adopted with a 12-point call to the world community to develop the world's health workforce, especially in the poorest countries.<sup>5</sup> As surgeons, we are calling to arms the U.S. surgical community to confront this crisis.

Though an integral part of health systems, essential surgical services have been sidelined as a luxury by public health efforts in developing nations. Overwhelmingly, the major donor organizations that set the global health agenda support programs exclusively related to infectious diseases. As a result, the already limited numbers of health workers in poor countries are more interested in working with these organizations than pursuing careers in surgery and anesthesia, where there are fewer profitable opportunities.<sup>6</sup> It is generally unrecognized that surgical conditions account for an estimated 11 percent of the total global burden of disease, led by traumatic conditions. Africa, in particular, has the world's highest concentration of surgical disease burden.<sup>7</sup> Some researchers have estimated that 90 percent of the global surgical need is in the developing world.<sup>8</sup> However, current spending on human immunodeficiency virus research is almost 200 times that of injury research when controlled for relative disease burden.<sup>9</sup> To create better balance in donor focus, there is an urgent need for surgeons to document the unmet global surgical need, to advocate for patients and local clinicians abroad, and to affirm the role of surgery within global public health.

### **Surgical workforce migration**

The migration of health workers from poor countries is under particular recent scrutiny because of the added burden this effect places on already strained health systems.<sup>10,11</sup> Overall, global migration is growing inexorably, and professionals and nonprofessionals alike will continue to migrate for better opportunities. It is estimated that 25 million people migrate every



During a surgical mini-camp at a district hospital in the north of Uganda, multiple patients must undergo surgery in one room to accommodate the need. Anesthesia is provided by anesthetic officers, and patients are hand-ventilated throughout their operation; the primary cardiac monitoring is by precordial stethoscope. Surgical personnel work with limited instruments and protective wear, and draping is limited, compromising sterility. (Photo by Cephas Mijumbi, MD, MMed [Anesthesia].)

year—1 million to the U.S. alone. As has been well documented, there are push and pull factors from source and recipient countries, respectively, that lead to migration.<sup>12</sup> While the number of U.S. medical graduates is constant, there are 30 percent more residency positions than graduate positions. Thus, the U.S. depends on international medical graduates (IMGs) to fill its residency posts and meet the growing demand for health care, fueled in part by economic growth and the needs of an aging population. Some have projected a physician shortage of 200,000 in the U.S. by 2020.<sup>13</sup> Already, 60 percent of IMGs in the U.S. are from low-income countries. Though a

small percentage of these are from sub-Saharan Africa, given the very small source pool, this is a significant number. In general surgery residency programs, 10 percent of first-year postgraduate posts are held by IMGs, though there are little data on the distribution of source country.<sup>14</sup>

Many more IMGs from low-income countries who have migrated have yet to obtain licenses to practice in recipient countries.<sup>15</sup> They may outnumber those currently practicing and very little is known about the characteristics of this group. With surgeons in particular, because of the length and intensity of training, the costs borne by the host country that has invested in



The numbers of nurses and equipment is limited, meaning that postoperative monitoring is very limited or absent for patients such as this one, who just underwent a laparotomy for a liver laceration sustained during a traffic accident. (Photo by Dr. Ozgediz.)

the education of a surgeon are likely to be very significant. Some experts have proposed bonding trainees to periods of service in low-income countries that have invested in their training, whereas others have called for reparations from recipient countries to reimburse low-income countries for these training costs. Although based on ethically sound principles, these policies are practically very difficult to implement.

The promise of working in a better system with more opportunities for learning and advancement, with corresponding compensation, pulls some of the brightest physicians-in-training from developing countries to the U.S., even despite the significant cost and toil associated with such a move.<sup>16</sup> As the increase in U.S. residency positions is projected to outstrip growth in the U.S. medical student production, this pull effect will predictably increase the number of IMGs who seek training positions in the U.S. This effect will exacerbate the already inequitable

distribution of surgical manpower worldwide.

The push factors that drive emigration must also be recognized. The factors most frequently cited are poor compensation and family opportunities, occupational risk of infectious diseases, and dilapidated health systems and hospital conditions that lead to low morale among health workers who may have skills that transcend local capacity. Another underappreciated factor is the ironic coexistence of a human resource shortage with unemployment of trained workers as a result of limited job opportunities. This outcome is partially a consequence of mandatory debt repayments and limits on health spending imposed by the International Monetary Fund to protect against inflation and ensure payment of domestic debt. Recent analyses suggest that there is insufficient macroeconomic evidence to support these policies, which may further cripple health services.<sup>17</sup>

Although locally derived solutions to these problems are critical, creative approaches by developed countries can also have a significant impact.<sup>18</sup> The Norwegian government, for example, has committed to directly support the compensation of health workers in poor countries and to produce more of its own physicians—thus addressing both push and pull factors. The International Council of Nurses, the Health Worker Migration Global Policy Council, and other bodies have issued guidelines for ethical recruitment in low-income countries to avoid poaching. Meanwhile, the U.K.-South Africa memorandum of understanding on the health workforce also outlines key principles to strengthen the South African health system, to increase U.K. health worker self-sufficiency, and to guide ethical recruitment to stem the unchecked flow of South African health workers to the U.K. However, these examples are of current practices—very little is known about which policies work because of a lack of systematic research on effective policies in human resources for global health.<sup>19</sup>

### ***A great opportunity***

Training institutions and associations in the U.S.—the most surgically resourced country in the world—have an opportunity to take a leadership role in facing the global surgical workforce

crisis. For example, partnerships, or “twinning” programs between U.S. training institutions and their counterparts in low-income countries, have the potential for great impact. There is an unprecedented enthusiasm and energy among U.S. surgical trainees toward global health care, part of a greater acknowledgment of its role in medical training.<sup>20,21</sup> Harnessing this momentum in a thoughtful fashion can help build greater surgical capacity globally. Mutually beneficial partnerships between American overseas partner institutions can share knowledge, skills, and resources. This collaboration can increase local capacity to train surgical providers, and improving local working conditions can then increase recruitment, training, and retention of surgeons in poor countries. Such partnerships have been identified as one tactic among several key strategies for scaling up education and training of health workers worldwide.<sup>22</sup>

By providing a supportive work environment—the material resources necessary to deliver patient care according to one’s training, collegial camaraderie, and intellectual stimulation—we believe that professional migration can be mitigated. If this outcome proves to be true, then such twinning programs will be vital to addressing the surgical workforce shortage. They must, however, be carefully designed to avoid paradoxically exacerbating the “brain drain” instead of fostering capacity building.<sup>23</sup>

Some may believe that this work is reserved for the community of international humanitarian organizations. Undoubtedly, volunteerism plays an important role as a stopgap measure to meet workforce shortages in low-income countries. The College’s Operation Giving Back program has been a leader in coordinating such voluntary missions, and many nongovernmental and pri-



The limited surgical and anesthesia workforce is one of multiple reasons why patients who access care have already very advanced disease that requires more complex surgery or would be potentially curable at an earlier stage of disease. This young man was unable to obtain surgical evaluation for four years while this chondrosarcoma steadily grew. (Photo by Dr. Riviello.)

vate volunteer organizations provide essential surgical services to vulnerable populations in low-income countries.<sup>24</sup> Much can be learned from the experiences of these organizations in providing high-quality care in austere medical environments. However, only through a systematic, coordinated response from training institutions and associations can the human resource problem be truly confronted.<sup>25</sup>

To have a sustainable impact on patient care, we must also work closely with anesthesia and nursing training programs and associations, the same as we do in the operating room for each individual patient. At the most basic level, we believe in the essential human right to the “highest attainable standard of health care,” as promoted by the WHO, which is inclusive of surgical care. We have an opportunity to move toward greater equity in surgery and elimination of disparities in surgical care worldwide. It is an urgently shared responsibility that transcends borders. The lessons learned in this process may,



Many injured patients do not have expeditious care of fractures and emergency trauma care, leading to complications and long-term morbidity. This man sustained complex open femur and tibia/fibula fractures when thrown from a truck in rural Angola. (Photo by Dr. Riviello.)

in turn, inform how we approach local disparities in access to surgical care in the U.S.

March's Global Forum on Human Resources for Health demonstrated increasing global recognition of the central role of the health workforce to improve health in poor countries. There is also an increasing awareness, even among non-surgeons, that surgical conditions in low-income

countries exact an enormous and heretofore neglected health and economic burden.<sup>26</sup> Finally, the global health community is beginning to emphasize the overall improvement of health systems rather than solely focusing on disease-specific interventions.<sup>27</sup> Certainly, developing surgical delivery requires investing in infrastructure and addressing barriers to care in addition to training surgical providers. Given these factors, U.S. surgical associations and training programs now face a critical opportunity to explore what we can do to help meet global training needs, to partner with other associations around the world, and to declare as surgeons what contribution we will make to solving the world's health workforce crisis. [\[Q\]](#)

### References

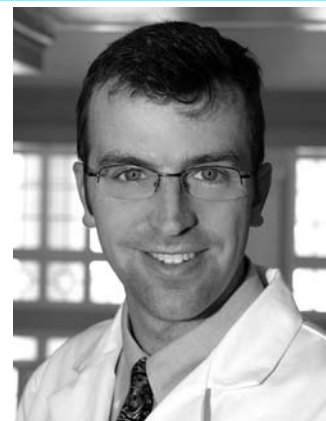
1. WHO. World Health Report: *Working Together for Health*. 2006. Available at: [http://www.who.int/whr/2006/whr06\\_en.pdf](http://www.who.int/whr/2006/whr06_en.pdf). Accessed March 12, 2008.
2. MacGowan WA. Surgical manpower worldwide. *Bull Am Coll Surg*. 1987;72(6):5-7,9.
3. Hodges SC, Mijumbi C, Okello M, et al. Anesthesia services in developing countries: Defining the problems. *Anesthesia*. 2007;62:4-11.
4. Ross S, Polsky D, Sochalski J. Nursing shortages and international nurse migration. *Int Nurs Rev*. 2005;52(4):253-262.
5. WHO. Health Workers for All and All for Health Workers, The Kampala Declaration and Agenda for Global Action. Available at: [http://www.who.int/workforcealliance/forum/2\\_declaration\\_final.pdf](http://www.who.int/workforcealliance/forum/2_declaration_final.pdf). Accessed March 12, 2008.
6. Galukande M, Kijjambu S, Luboga S. Improving recruitment of surgical trainees and training of surgeons in Uganda. *East Central Afr J Surg*. 2006;11(1):17-24.

7. Debas H, Gosselin R, McCord C, Thind A. Surgery. In: Jamison D, ed. *Disease Control Priorities in Developing Countries*. 2nd ed. New York: Oxford University Press; 2006.
8. King M, Bewes P, Cairns J, Thornton J. *Primary Surgery*. New York: Oxford University Press; 1990.
9. Roberts I, Shakur H, Edwards P, et al. Trauma care research and the war on uncertainty. *BMJ*. 2005;331(7525):1094-1096.
10. Debas H. The problem of heavy reliance on international medical graduates to supply the surgical workforce in the United States. *Surgery*. 2006;140:359-361.
11. Sheldon G. Globalization and the health workforce shortage. *Surgery*. 2006;140:354-358.
12. Mullan F. The metrics of the physician brain drain. *N Engl J Med*. 2005;353:1810-1818.
13. Cooper R. The coming era of too few physicians. *Bull Am Coll Surg*. 2008;93(3):11-18.
14. Horvath K, Pelligrini C. Selecting international medical graduates (IMGs) for training in US surgical residencies. *Surgery*. 2006;140(3):347-350.
15. Mullan F. Panel on migration. Global Health Workforce Forum, Kampala, Uganda. March 2-7, 2008.
16. Leon L, Ojeda H, Mills J, et al. The journey of a foreign-trained physician to a United States residency: Controversies surrounding the impact of this migration to the United States. *J Am Coll Surg*. 2008;206(1):171-176.
17. McCoy D, Bennett S, Witter S, et al. Salaries and incomes of health workers in sub-Saharan Africa. *Lancet*. 2008;371:675-681.
18. Robinson M, Clark P. Forging solutions to health worker migration. *Lancet*. 2008;371:691-693.
19. Chopra M, Munro S, Lavis J, Vist G, Bennett S. Effects of policy options for human resources in health: An analysis of systematic reviews. *Lancet*. 2008;371:668-674.
20. Powell AC, Mueller C, Kingham P, Berman R, Pachter HL, Hopkins MA. International experience, electives, and volunteerism in surgical training: A survey of resident interest. *J Am Coll Surg*. 2007;205(1):162-168.
21. Drain P, Primack A, Hunt D, Fawzi W, Holmes K, Gardner P. Global health in medical education: A call for more training and opportunities. *Acad Med*. 2007;82:226-230.
22. Crisp N, Gawanas B, Sharp I. Training the health workforce: Scaling up, saving lives. *Lancet*. 2008;371:689-691.
23. Gibney EJ. Should overseas doctors be trained at home? *Br J Hosp Med*. 1990;43(4):254.
24. Casey KM. The global impact of surgical volunteerism. *Surg Clin North Am*. 2007;87(4):949-960.
25. Ajayi OO. The responsibility of established colleges to the developing world. *Aust N Z J Surg*. 1994;64(1):4-6.
26. Farmer P, Kim J. Surgery and global health: A view from beyond the OR. *World J Surg*. 2008; epub ahead of print.
27. Reich M, Takemi K, Roberts M, Hsiao W. Global action on health systems: A proposal for the Toyako G8 summit. *Lancet*. 2008;371:865-869.

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