But What if There Are No Teachers …?

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IT is a sobering realization that our ability to dedicate an issue of ANESTHESIOLOGY to education, and to agonize about topics such as required simulation experience and optimal faculty–resident ratios, is a luxury not shared by much of the world. In many resource-poor environments, the number of clinical specialists is so low that even if qualified students, adequate facilities, and appropriate materials are present, education still may not occur, simply because there are no teachers.

The United States has approximately 25 physicians per 10,000 population. More than 30 countries make do with less than 1/10 of this number; the vast majority of these are in Africa (fig. 1). The resulting problems with healthcare access are easily understood, but such a dearth of doctors also makes it essentially impossible to increase the number of physicians. Those in clinical practice are overworked, and the few that might be involved in teaching have to devote most of their time to administration. These countries are in a bind: there are insufficient staff physicians to educate many residents, and because not many residents are trained, there is no increase in the number of staff physicians. A critical mass of teachers is required before this problem can be solved, and therefore this vicious circle can be broken only with substantial outside teaching support.

Here are three examples from our specialty, covering a range of situations as found in east African countries with less than 1 physician per 10,000 population.

"… our concern here is how best to supplement the local faculty with foreign educators, to allow residency programs to build capacity."

1. Malawi has no local anesthesiologists. A very small residency program is run by foreign faculty and combines education at the central hospital, where residents are supervised largely by clinical officers (CO),* with a year in South Africa. The first trainee out of this program is about to graduate. Essentially all cases in the country's 25 hospitals are done by approximately 100 independently practicing COs; volunteers from Health Volunteers Overseas assist sporadically with CO training.† For comparison: Pennsylvania has about the same area and population as Malawi (approximately 15 million people); it has 1,900 anesthesiologists‡ and 3,600 nurse anesthetists.§
2. Tanzania has less than 10 anesthesiologists. Most work in private clinics in Dar es Salaam. One is employed at the university hospital in Bugando, where he is mostly engaged in administration, and does some didactic teaching for COs. Foreigners assist with CO training in Bugando and other places in the country.‖
3. Rwanda has about a dozen anesthesiologists, all employed at the two university hospitals, a military hospital, and one private clinic; work in approximately 40 other hospitals is done by COs. The Canadian Anesthesiologists' Society and the American Society of Anesthesiologists have provided teaching and logistical support to a Rwandan residency program started in 2006.# This program has graduated several specialists, who have

Photo: M. Durieux.

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* Clinical officers are mid-level providers, usually with four yr formal training. Available at: http://en.wikipedia.org/wiki/Clinical_officer. Accessed August 20, 2013.

† Where we work. Available at http://www.hvousa.org/whereWeWork/anesthesia.shtml. Accessed August 20, 2013

‡ Martin DE: Dicipline of anesthesiology, Anesthesiologists Physicians Protecting Patients. Available at: http://www.psanes.org/Anesthesiologists/MedicalStudents/DisciplineofAnesthesiology/tabid/116/Default.aspx, Pennsylvania Society of Anesthesiologists. Accessed July 17, 2013.

§ About us. Available at: http://www.pana.org/?page=about_us. Accessed July 17, 2013.

‖ MUSC Anesthesia Global Health Initiative: Project Madaktari. Available at: http://clinicaldepartments.musc.edu/anesthesia/Global_health/. Accessed July 17, 2013.

Canadian Anesthesiologists' Society IEF: CAS IEF Mission in Rwanda. Available at: http://www.cas.ca/English/CASIEF-Rwanda. Accessed July 17, 2013.

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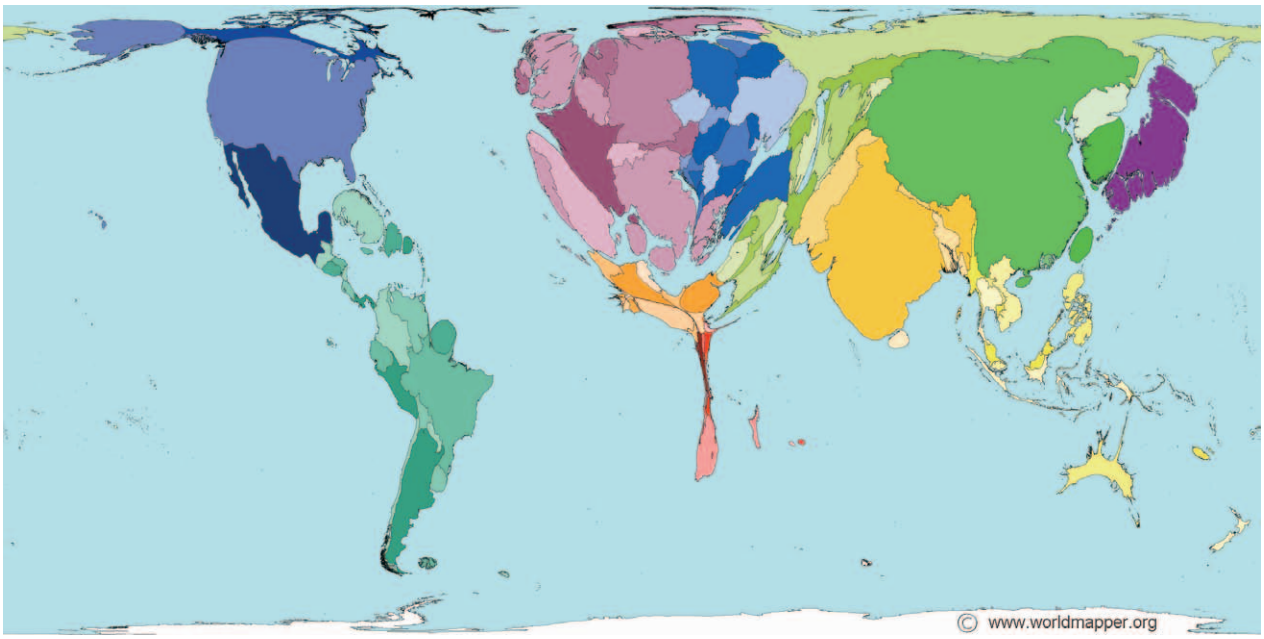

Fig. 1. Physicians working around the world. The relative size of each territory on the map corresponds to the proportion of all physicians in the world who work there. In 2004 there were 7.7 million physicians working around the world. If physicians were distributed according to population, there would be 12.4 physicians to every 10,000 people. The most concentrated 50% of physicians live in territories with less than a fifth of the world population. The worst off fifth are served by only 2% of the world's physicians. Note the disproportionately low number of physicians in Africa (*red*). © Copyright Sasi Group (University of Sheffield, Sheffield, United Kingdom) and Mark Newman (University of Michigan, Ann Arbor, Michigan). Reproduced under Creative Commons license.

then spent additional training time in Canada. Currently, a large-scale interdisciplinary program, Human Resources for Health (also see announcement on page 26A in this issue of Anesthesiology), is expanding residency education in many specialties by an influx of foreign teaching faculty (more than 100 FTE, of which 5 anesthesiologists).**

These are complex situations, but they have simple and direct implications for patient care. Although COs often have a wealth of clinical experience and are technically skilled, their limited training in physiology, pharmacology, and the principles behind anesthesia practice is a severe constraint and contributes to the high perioperative mortality in these countries (5–10%, with mortality related to general anesthesia as high as 1 in 150).†† That COs themselves are in short supply and overworked only compounds the problem.

Appropriate national policy and financial capability are essential to solve these issues: one needs to educate enough medical students to provide inflow into residencies and specialists, and once they graduate from their training programs, they must be adequately supported. In some countries, residents and COs have to pay tuition, making it difficult for many to pursue specialization. But our concern here is how best to supplement the local faculty with foreign educators, to allow residency programs to build capacity. There is no single right answer, yet many vital issues to consider. Here are some pertinent questions referenced to the situation in Rwanda.

1. *Who organizes the program?* It is critical that any such program be comprehensive and unified, and driven by the local clinicians and administration—they are the only people who understand the local situation. Too many organizations send teachers for short periods of time at irregular intervals, which can never be a structural solution. Preferably, all efforts directed at a residency program should be aligned, and all visiting faculty should teach according to a defined curriculum, with local faculty in charge of the process. The Canadian Anesthesiologists' Society/American Society of Anesthesiologists program in Rwanda is a good example: the program sends one anesthesiologist—United States or Canadian—each month, and thus provides a full FTE. A detailed curriculum tells each visiting faculty member exactly which subjects to teach.
2. *Who are we teaching: residents or COs?* Realistically, COs will be the primary anesthesia providers in most hospitals for many years to come, and it is in the patients' best interest that COs are optimally taught. Therefore,

** Human Resources for Health Program RoR: US Rwanda health project. Available at: http://hrhconsortium.moh.gov.rw/. Accessed July 17, 2013.

†† WHO Guidelines for Safe Surgery 2009. Available at: http://whqlibdoc.who.int/publications/2009/9789241598552_eng.pdf, World Health Organization (WHO), 2009. Accessed July 17, 2013.

participation in CO training is highly valuable. But if the eventual goal is to have, say, at least one anesthesiologist available in each hospital, residencies will have to be started and residents educated at the same time that we help train COs.

3. *Should we go there, or should they come here?* Instead of setting up residency programs in various countries and sending faculty over to teach, it may seem attractive to bring a few residents at a time from a resource-poor country to the United States and let them take part in our training programs. However, this approach has many problems. Licensing requirements are a major stumbling block, but maybe more important is that such people would be trained in a way of providing anesthesia that is radically different from what they will do back home. In fact, they would learn to use drugs and techniques that mostly do not exist in their country, and not gain familiarity at all with those they will be using there. What is feasible and useful, as shown by the Canadian Anesthesiologists' Society/American Society of Anesthesiologists program, is for residents who have completed training to spend several months in a western country to learn advanced techniques.
4. *Can we do distance teaching instead?* We can, and we should, but it cannot replace bedside teaching in the operating room. Technically, video conferencing to most locations in the world is feasible these days. Our institution does regular joint case conferences with the residents in the Rwanda program and our own, and both sides find these very educational and enjoyable.
5. *How much time should visiting faculty spend?* The answer to this question depends on many factors. A longer stay (6 months at least) may be preferable, as it allows the faculty to truly understand the work environment of the trainees. But it is very difficult for a practicing anesthesiologist to take extended time off work, if only because of the financial implications. The Rwanda Human Resources for Health program requires extended stays (preferably a year), but that program comes with substantial salary support. Other programs, such as the Canadian Anesthesiologists' Society/American Society of Anesthesiologists program, have demonstrated that short-term faculty, when properly guided, can be effective. Even in that setting, though, long-term contacts are necessary for curriculum building.
6. *Should U.S. residents participate?* Being able to teach in a country with very different approaches to anesthesia is an extremely valuable contribution to a resident's education.[1] Senior residents are very effective teachers because they often connect more easily with the local resident group, and may carry a greater store of practical clinical pearls to share than does the more academic faculty member. Many overseas teaching programs allow resident participation, and the American Board of Anesthesiology has formulated a set of rules that allow time spent on such effort to count toward residency requirements. U.S. teaching hospitals are not always willing to pay residents' salaries during away rotations, but they should be strongly urged to support these efforts—after all, the hospital will be more than willing to share the publicity that comes from this kind of work.

We should support well-designed overseas teaching efforts. Because without our help, it will remain impossible for the few, overworked anesthesiologists in Africa and elsewhere to create the critical mass, to train enough residents, and to break the vicious cycle of insufficient personnel that prevents each patient from having access to an anesthesiologist when needed.

Competing Interests

The author is not supported by, nor maintains any financial interest in, any commercial activity that may be associated with the topic of this article.

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Reference

1. Hau DK, Dipace JI, Peck RN, Johnson WD Jr: Global health training during residency: The weill cornell Tanzania experience. J Grad Med Educ 2011; 3:421–4