

The World Federation of Societies of Anaesthesiologists, International Anesthesia Research Society, and *Anesthesia & Analgesia*: A Shared Global Vision

Isabeau A. Walker, MB BChir, FRCA,*† and Steven L. Shafer, MD

This month sees the launch of a new Global Health section in *Anesthesia & Analgesia*, and a new type of manuscript, “Global Health Reports” in *A&A Case Reports*, which marks the creation of an important affiliation between the World Federation of Societies of Anaesthesiologists (WFSA) and the International Anesthesia Research Society (IARS).

The links between the WFSA and IARS go back many years. Francis Hoeffler McMechan founded the IARS, and was a very keen advocate of a worldwide organization for anesthesia. The first World Congress of Anesthesiologists was held in 1955. At the end of the meeting, 26 national societies of anesthesiology formally launched the WFSA. The first president of the WFSA was Harold Griffith, a former president of IARS (1948). Dr. Griffith was a pioneer in anesthesia who introduced curare into clinical practice. Today, the WFSA is an affiliation of 125 member societies from 140 countries and remains true to the vision of the founding members, supporting training fellowships, the journal *Update in Anaesthesia* and *Anaesthesia Tutorial of the Week* (www.wfsahq.org).

The patient comes first. This is the basic principle underlying every editorial decision of *Anesthesia & Analgesia*. This is reflected in the mission statement of the Journal: “*Anesthesia & Analgesia* exists for the benefit of current and future patients under the care of health care professionals engaged in the disciplines broadly related to anesthesiology: perioperative medicine, critical care, and pain management. The Journal furthers the care of these patients by reporting the fundamental advances in the sciences of these clinical disciplines and by documenting the clinical, administrative, and educational advances that guide therapy.”

The patient comes first. That is the fundamental view of the WFSA, whose mission is “To improve patient care by uniting anaesthesiologists around the world. We deliver our mission through programmes that are implemented in partnership with National Societies of Anaesthesiology and other organisations that share our objectives. We work with the World Health Organisation (WHO), with governments, with other standard setters, with surgical organisations, with NGOs (nongovernmental organizations), with hospitals and with training centres and we welcome partnerships with organisations that support safe surgery and recognise that safe anaesthesia is an essential element of the same.”

The patient comes first. It sounds good, but what metrics suggest that we “walk the walk” and actually put patients first? Bainbridge and colleagues conducted a systematic review of perioperative and anesthetic-related mortality published up to 2011.¹ They reviewed all studies, in any language, that reported perioperative outcomes after surgery in patients undergoing general anesthesia. They only considered studies with at least 3000 subjects. A total of 87 studies were included in their analysis, describing outcomes for >21.4 million patients. Most studies reported outcomes in the perioperative period or within the first 24 to 48 hours after surgery.

Bainbridge et al. found that mortality solely attributable to anesthesia, or where anesthesia was a contributory factor decreased progressively over time, despite a significant increase in baseline ASA status each decade. This is a great credit to our profession, to the improvements in training and education that have allowed us to increase the safety of anesthesia and surgery. It is a tribute to the systems we have put together to promote patient safety. It is a tribute to the device and drug industries who have advanced our technologies and therapeutic options.

However, before we declare “mission accomplished” and switch to more pressing health care concerns, it is important to dig a little deeper. The United Nations Human Development Index (HDI) is a measure based on life expectancy, literacy, education, and per capita income. Improvements in anesthesia-related mortality have only been seen in countries with a high HDI. The risk of dying from an anesthesia-related cause has increased over time in the poorer corners of the planet. In the Bainbridge et al. study, the risk of dying of anesthesia complications was 3 times higher in low-HDI countries compared to high. This is in addition to patients in low-HDI countries having

From the *World Federation of Societies of Anaesthesiologists, and Consultant Paediatric Anaesthetist, Great Ormond Street Hospital, NHS Foundation Trust, London, United Kingdom; and †Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University, Stanford, California.

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Address correspondence to Steven L. Shafer, MD, Department of Anesthesiology, Perioperative and Pain Medicine, Stanford University School of Medicine, 300 Pasteur Dr., MC-5640, Stanford, CA 94305. Address e-mail to steven.shafer@stanford.edu.

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twice the risk of cardiac arrest during surgery as their more wealthy counterparts. Smaller studies, excluded from the Bainbridge et al. review, document even greater risk of anesthesia-related mortality in recent times.²

If we want to place the patient first, then we must understand why these differences in outcomes exist. Every patient who requires anesthesia and surgery merits our attention. We must improve the outcomes for all patients, not just the rich ones. The challenges facing anesthesia providers in low- and middle-income countries (LMICs) are well described. There are few trained anesthetists, and even fewer trained anesthesiologists. These practitioners struggle with inadequate supplies of essential drugs, inadequate equipment, and unreliable infrastructure to support surgery.³ A recent survey of 590 facilities in 22 LMICs found that 55% did not have reliable running water, electricity, or oxygen supplies. Amazingly, 44% did not have a functioning anesthesia machine.⁴ How can safe anesthesia be provided under such circumstances?

The outcome for patients is poor access to surgery. Lack of access, coupled with economic barriers to surgical care (e.g., catastrophic out of pocket payments), results in patients presenting late, often with gross pathological deformity and advanced disease. Our anesthesia colleagues working in fragile health care systems in LMICs are managing patients of the highest acuity in the most resource-constrained environments. The observed differences in mortality are not surprising.

Underlying all of this is the neglected position of surgery in global public health policy. In 2004, countries with low expenditure on health care (annual per capita expenditure on health care <\$100) accounted for 34.8% of the world's population, but undertook just 3.5% of global surgical procedures.⁵ Eleven percent to 15% of the world's burden of disease, represented in terms of Disability Adjusted Life Years, is amenable to surgical intervention, particularly injury, malignancy, congenital abnormalities, and obstetric complications, with the greatest unmet need in Africa and Southeast Asia.⁶ Cesarean delivery rates are consistently <1% in the poorest communities in southern Asia and sub-Saharan Africa, with obvious consequences for mothers and their children.⁷ Eight hundred mothers die every day from complications of pregnancy and childbirth.^{8,9} In LMICs, the surgical patient comes last.

There has been a dearth of research published about the health problems facing poorer populations.¹⁰ Surgical services have been particularly neglected, as surgery is frequently regarded as an expensive luxury in LMICs. However, there are signs that this view is changing. The United Nations Sustainable Development Goals will replace the United Nations Millennium Development Goals after 2015. Health-related Goal 3 is to "ensure healthy lives and promote well-being for all at all ages," which includes a commitment to universal health coverage with financial protection and access to quality essential health care services.¹¹ The Lancet Commission into Global Surgery was launched in 2014 to examine the current state of surgery and anesthesia and to consider how safe, affordable, high-quality surgical health care can be provided as part of universal health coverage, with financial protection for those in need.¹² A recent systematic review from some of the Commission

authors highlighted that cesarean delivery and orthopedic surgery are more cost effective than human immunodeficiency virus treatment with multidrug antiretroviral therapy. General surgery, cleft lip and palate repair, ophthalmic surgery, and hydrocephalus surgery are as cost effective as Bacillus Calmette–Guérin vaccination.¹³ "Essential Surgery" will be considered as a specific chapter in the up-coming Disease Control Priorities publication from the University of Washington Department of Global Health and the Institute for Health Metrics and Evaluation, and will focus on basic and emergency surgery that can be provided in the district hospital in LMICs.¹⁴ The World Health Assembly (WHA) is the governing body of the WHO and considers the specific health agenda proposed by the Executive Board. In May 2014, there was unanimous support from the WHA Executive Board for an agenda item "Strengthening Emergency and Essential Surgical Care and Anaesthesia as a Component of Universal Health Coverage." It is hoped that this will be passed as a resolution at the 68th meeting of the WHA in May 2015.¹⁵ All Ministries of Health will then be required to address essential surgical services as part of their annual health plan.

Part of the goal of the alignment between the WFSA and the IARS is to share research goals. There are many research questions that need to be answered about anesthesia services in LMICs. "Task shifting" describes the situation where health care providers who have shorter training and fewer qualifications undertake roles traditionally performed by highly qualified individuals, to improve access to care.¹⁶ For anesthesia, this has been the norm for decades in many LMICs. Can safer systems be created to make good use of human resources and strengthen support for these anesthesia providers? What are the barriers and what do the successful programs look like? What is the most effective way to maintain standards and to provide continuing education where there are few anesthesiologists?³ The successful Lifebox campaign for access to pulse oximetry demonstrates how national societies can work together to improve patient safety (www.lifebox.org). How can this and other quality improvement initiatives to improve health systems be scaled up?^{17,18} Ketamine is the mainstay of anesthesia in many parts of the world. Will proposed changes in the scheduling of ketamine by the WHO Expert Committee on Drug Dependence have an impact on access to this vital drug? Spinal anesthesia is often promoted as a safer option for cesarean delivery. What is the complication rate from spinal anesthesia in LMIC settings where there are no automated blood pressure monitors or access to vasoconstrictor agents? The introduction of a Global Health section in *Anesthesia & Analgesia* and the WFSA–IARS Global Health Reports will provide the opportunity for online publication of research data, audit, and quality improvement activities for investigators around the globe.

Innovative solutions are required. What works in an academic health center in North America may not be easily translated to all WFSA member societies, particularly in sub-Saharan Africa. The WFSA has been involved in developing a new ISO standard 8835–7:2011 for anesthetic systems for use in areas with limited logistical supplies of electricity and anesthetic gases. The WFSA Quality and Safety Committee has produced guidance to support purchase of anesthetic

machines in different regions of the world.^{19,20} The question remains, what is the design of the ideal anesthesia work station suited to countries where the mains voltage fluctuates from 15% below to 20% above the mains rating, outages are the norm, and there are few biomedical engineers?²¹ Companies such as Gradian Health Systems (<http://www.gradianhealth.org/>) and Diamedica (<http://www.diamedica.co.uk>) have developed equipment for resource-constrained areas. However, we believe all major anesthesia device manufacturers should develop technology that can be adapted to reach the population of sub-Saharan Africa, which now approaches nearly 1 billion people.²²

The concept of “value innovation” must also be considered. There have been some notable examples in surgical practice. The Ilizarov external fixator was developed in Siberia in the 1950s to repair fractures at a fraction of the cost of internal implants. This device can be manufactured for as little as \$12.²³ The use of mosquito mesh for hernia repair in LMIC settings provides as good an outcome as “medical grade” mesh at a fraction of the cost.²³ Are there similar examples in anesthesia practice? If so, these would be appropriate topics for Global Health Case Reports in *A&A Case Reports*.

“Health partnership” schemes between institutions, universities, or professional organizations in high-income countries and LMICs are an innovative way to support volunteering and increase capacity in LMIC. These have the potential to benefit to all partners, particularly relating to clinical and management skills, communication, teamwork, understanding health systems, training and research, as well as personal satisfaction from a long-term interest in global health.^{24,25} As programs are scaled up and receive funding from international foundations, Global Health Reports in *A&A Case Reports* will provide an ideal forum to describe successful anesthesia partnerships from all perspectives.²⁶

Finally, investment in surgical and anesthesia services is an urgent priority for our patients. Little progress will be made without this. How do we as professionals advocate for this? There needs to be an academic approach, including hypotheses, data collection, and rigorous assessment of outcomes. This is one way *Anesthesia & Analgesia* can advance patient care in LMICs. There also needs to be political advocacy, a role for the WFSA. The WFSA has official relations with WHO, and supported the case for access to safe surgery and anesthesia as part of universal coverage at the 2014 WHA. The WFSA continues to make this case.²⁷ There is also a need for advocacy for investment in anesthesia services from a humanitarian perspective. This is a role for us as individuals.

We must be mindful of the role of anesthesia in the global health agenda. We need to think about improvements in perioperative health care and how these improvements can be applied. We need to think about challenges and successes, and how we can learn from each other. The WFSA–IARS affiliation is an opportunity to share a global vision relating to anesthesia, specifically relating to investigation, innovation, and investment in anesthesia services. In our WFSA–IARS affiliation, the shared goal is to move every patient requiring anesthesia and surgery to the front of the line. Our vision is a world in which every patient comes first. ■■

RECUSE NOTE

Dr. Steven L. Shafer is the Editor-in-Chief for *Anesthesia & Analgesia*. This manuscript was handled by Dr. James G. Bovill, Guest Editor-in-Chief, and Dr. Shafer was not involved in any way with the editorial process or decision.

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Contribution: This author helped write the manuscript.

Attestation: Isabeau A. Walker approved the final manuscript.

Name: Steven L. Shafer, MD.

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REFERENCES

- Bainbridge D, Martin J, Arango M, Cheng D; Evidence-based Peri-operative Clinical Outcomes Research (EPiCOR) Group. Perioperative and anaesthetic-related mortality in developed and developing countries: a systematic review and meta-analysis. *Lancet* 2012;380:1075–81
- Walker IA, Wilson IH. Anaesthesia in developing countries—a risk for patients. *Lancet* 2008;371:968–9
- Walker IA, Bashford T, Fitzgerald JE, Wilson IH. Improving anesthesia safety in low-income regions of the world. *Curr Anesthesiol Rep* 2014;4:90–99
- Vo D, Cherian MN, Bianchi S, Noel L, Lundeg G, Taqdeer A, Jargo BT, Okello-Nyeko M, Kahandaliyanage A, Setumbwe-Mugisa O, Ochroch E A, Okello D, Abdoulie J, Ayankogbe OO, Soyannwo OA, Hoekman P, Bossyn P, Sani R, Thompson M, Mwinga S, Prasad S, Wekesa M, Toliwa O, Kibatala P, McCunn M. Anesthesia capacity in 22 low and middle income countries. *J Anesth Clin Res* 2012;3:4
- Weiser TG, Regenbogen SE, Thompson KD, Haynes AB, Lipsitz SR, Berry WR, Gawande AA. An estimation of the global volume of surgery: a modelling strategy based on available data. *Lancet* 2008;372:139–44
- Debas HT, Gosselin R, McCord C, Thind A. Surgery. In: Jamison DT, Breman JG, Measham AR, et al., eds. *Disease Control Priorities in Developing Countries*. 2nd ed. New York: The World Bank, Oxford University Press, 2006:1245–59
- Cavallaro FL, Cresswell JA, França GV, Victora CG, Barros AJ, Ronsmans C. Trends in caesarean delivery by country and wealth quintile: cross-sectional surveys in southern Asia and sub-Saharan Africa. *Bull World Health Organ* 2013;91:914–922D
- Boozary AS, Farmer PE, Jha AK. The Ebola outbreak, fragile health systems and quality as a cure. *JAMA* 2014;312:1859–60
- WHO. Ten facts on the state of global health. Available at: http://www.who.int/features/factfiles/global_burden/facts/en/index5.html. Accessed October 31, 2014
- Evans JA, Shim JM, Ioannidis JP. Attention to local health burden and the global disparity of health research. *PLoS One* 2014;9:e90147
- United Nations. Open working group proposal for Sustainable Development Goals. 2014. Available at: <http://sustainabledevelopment.un.org/content/documents/1579SDGs%20Proposal.pdf>. Accessed November 2, 2014
- Meara JG, Hagander L, Leather AJ. Surgery and global health: a Lancet Commission. *Lancet* 2014;383:12–3
- DCP³. Disease Control Priorities—economic evaluation for health. Available at: <http://www.dcp-3.org/>. Accessed November 2, 2014
- Chao TE, Sharma K, Mandigo M, Hagander L, Resch SC, Weiser TG, Meara JG. Cost-effectiveness of surgery and its policy implications for global health: a systematic review and analysis. *Lancet Glob Health* 2014;2:e334–45

15. World Health Organization. Executive Board. Strengthening emergency and essential surgical care and anaesthesia as a component of universal health coverage. Report by the Secretariat. Available at: http://apps.who.int/gb/ebwha/pdf_files/EB135/B135_3-en.pdf. Accessed November 2, 2014
16. World Health Organization. WHO recommendations. Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting. Optimizemnh. 2012. Available at: http://apps.who.int/iris/bitstream/10665/77764/1/9789241504843_eng.pdf?ua=1. Accessed December 15, 2014
17. Srofenyoh E, Ivester T, Engmann C, Olufolabi A, Bookman L, Owen M. Enhancing obstetric and neonatal care in a regional hospital in Ghana via continuous quality improvement. *Int J Gyn Obst* 2012;116:17–21
18. Funk LM, Conley DM, Berry WR, Gawande AA. Hospital management practices and availability of surgery in sub-Saharan Africa: a pilot study of three hospitals. *World J Surg* 2013;37:2520–8
19. International Standards Organization. ISO 8835–7:2011. Inhalational anaesthesia systems – Part 7: Anaesthetic systems for use in areas with limited logistical supplies of electricity and anaesthetic gases. Available at: http://www.iso.org/iso/catalogue_detail.htm?csnumber=53545. Accessed November 2, 2014
20. World Federation of Societies of Anaesthesiologists. WFSA guideline for tendering for anaesthesia machines. 2014. Available at: http://www.wfsahq.org/images/documents/Three_Machine_Standards_Tender.pdf. Accessed November 2, 2014
21. Chao TE, Lo NC, Mody GN, Sinha SR. Strategies for last mile implementation of global health technologies. *Lancet Glob Health* 2014;2:e497–8
22. Peel D, Neighbour R, Eltringham RJ. Evaluation of oxygen concentrators for use in countries with limited resources. *Anaesthesia* 2013;68:706–12
23. Cotton M, Henry JA, Hasek L. Value innovation: an important aspect of global surgical care. *Global Health* 2014;10:1
24. Lipnick M, Mijumbi C, Dubowitz G, Kaggwa S, Goetz L, Mabweijano J, Jayaraman S, Kwizera A, Tindimwebwa J, Ozgediz D. Surgery and anesthesia capacity-building in resource-poor settings: description of an ongoing academic partnership in Uganda. *World J Surg* 2013;37:488–97
25. Jones FE, Knights DPH, Sinclair VFE, Baraitser P. Do health partnerships with organisations in lower income countries benefit the UK partner? A review of the literature. *Globalization and Health* 2014;9:38
26. Binagwaho A, Kyamanywa P, Farmer PE, Nuthulaganti T, Umubyeyi B, Nyemazi JP, Mugeni SD, Asiimwe A, Ndagijimana U, Lamphere McPherson H, Ngirabega Jde D, Sliney A, Uwayezu A, Rusanganwa V, Wagner CM, Nutt CT, Eldon-Edington M, Cancedda C, Magaziner IC, Goosby E. The human resources for health program in Rwanda—new partnership. *N Engl J Med* 2013;369:2054–9
27. World Health Organization. Statement by NGOs in official relations with WHO at the WHO governing body meetings. Available at: <https://apps.who.int/ngostatements/content/51-world-federation-societies-anaesthesiologists-wfsa>. Accessed November 2, 2014