

Finding surgery's place on the global health agenda

Billions of people worldwide do not have access to even the simplest surgical procedures. But a new global initiative has launched that hopes to change the situation. Bridget Huber reports.



Joshua Bukenya was barely a week old when he started having convulsions in March, 2014. His worried parents took him to be prayed over at a church near their home in eastern Uganda's Buyende district. At first, it seemed to work, said his mother, Mera. But, with time, it became clear that the child's head was growing abnormally large. In November, his mother brought him to the CURE Children's Hospital in the city of Mbale for treatment. There, doctors explained that he had infant hydrocephalus, a life-threatening accumulation of fluid in the brain, in his case likely caused by the infection that was also responsible for his seizures.

Joshua was luckier than most African children with hydrocephalus. His family lives close enough to a charity hospital that has pioneered a new treatment for the condition and provides the neurosurgery regardless of a family's ability to pay. But in sub-Saharan Africa, most children in need of such surgery for hydrocephalus—an estimated 250 000 each year—don't get it, and their prospects are dim. About half will die, in pain, by 2 years of age and most of those who survive will be severely disabled.

Even people who need a simple operation often go without; globally, about 5 billion people have no access to surgical care, according to the *Lancet's* Commission on Global Surgery published on April 27. That means conditions that could be treated surgically, like obstructed labour or appendicitis, can become a death sentence. And something as simple as a broken bone can disable a person for life. Scaling up basic surgical services in low-income and middle-income countries could save an estimated 1.5 million lives per year in these countries, according to the most recent edition of Disease Control Priorities.

Neglected issue

Although the burden of surgically treatable conditions is greater than that of tuberculosis, HIV/AIDS, and malaria combined, global health efforts have focused mainly on infectious diseases. This has led some to call surgery the neglected stepchild of global health. But movements to address the surgical gap have been gaining traction. Now, in the final year of the Millennium Development Goals, a group of doctors is pushing to make sure surgery is included in the post-2015 global health agenda.

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Among the hurdles they face is the "appalling myth that surgery is a rich person's luxury good", said Gavin Yamey, a physician who leads the Evidence to Policy Initiative at the University of California, San Francisco, and is a member of the *Lancet* Commission on Global Surgery, which aims to improve access to timely, affordable, safe surgery and anaesthesia care, particularly in low-income and middle-income countries. The Commission notes that of the 312.9 million surgical procedures undertaken worldwide in 2012, only 6.3% were done in countries comprising the poorest 37.3% of the world's population. Public health money mainly goes to communicable disease or preventive measures like vaccination, vitamin A supplementation, or sanitation. But a recent analysis published in *The Lancet Global Health* suggests surgery is often as cost effective as more widely accepted public health interventions. The analysis, a systematic review of more than

two dozen studies weighing the costs and benefits of surgery, found, for example, that circumcision is about as cost effective as standard vaccinations or distributing bednets to prevent malaria. And general surgery, ophthalmic surgery, and even hydrocephalus surgery are as cost effective as the anti tuberculosis BCG vaccine (which is the most widely used vaccine in the world) and more cost effective than antiretroviral therapy for HIV.

John Meara, director of the Program in Global Surgery and Social Change at Harvard Medical School, Boston, MA, and cochair of the *Lancet* Commission, says he doesn't want to see surgical care funded at the expense of other health priorities. Instead, he wants to see surgery recognised as an integral part of a functional health system. "It's not either-or", he said. "That would be like saying: what's more important in your car, the wheels or the engine? You can't drive your car unless you have both of those things."

Part of the way to get there, he believes, is by overhauling the way aid money is delivered, to ensure it is both

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For the *Lancet* Commission on Global Surgery see <http://www.thelancet.com/commissions/global-surgery>

For the paper on cost-effectiveness of surgery in resource-poor countries see *Articles Lancet Glob Health* 2014; 2: e334-45

For the latest edition of *Disease Control Priorities* see <http://www.dcp-3.org/volume/9/disease-control-priorities>



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transparent and horizontal—that is, not narrowly focused on specific diseases or conditions. “It should be targeted on health system strengthening and not just isolated vertical interventions”, Meara said. And, while surgical missions such as those that repair cataracts or cleft lips have their place, he said they should be done in coordination with national ministries of health.

As a starting place, the Commission recommends that countries focus on tracking three categories of surgery—caesarean sections, abdominal surgery, and treatment of fractures—and covering their costs for poor people. Meara says these operations are indicators for a health system that is relatively stable and capable of treating a range of conditions.

Non-physician clinicians

Of course, doing surgery is a much more complex undertaking than giving a vaccine or a bednet. Even the most basic of requirements—a steady supply of water and power—aren’t a given in resource-poor countries, much less the blood banks, laboratories, and anaesthesia machines needed to operate safely. Yet, despite these challenges, some poor countries have found innovative ways to meet some of the surgical need. Mozambique, for example, has fewer than 25 general surgeons for a population of about 25 million people. So, it relies on non-doctors, known as *tecnicos*—technicians—to do most operations, including caesarean sections, hernia repairs, and amputations.

The idea of putting scalpels into the hands of people who aren’t even doctors, let alone surgeons, has drawn some criticism. But Fernando Vaz, Mozambique’s former Minister of Health who teaches at the Superior Institute for Health Sciences in Maputo, says poor countries should be pragmatic and focus on meeting the needs of the many. Surgical technicians are cheaper to train than surgeons and tend to stay in rural areas, whereas surgeons are more likely to move

to cities or richer countries. “Every country needs to develop the strategy that makes the most sense for it, based on the resources that it has. A country like Mozambique can’t copy the health strategy of the USA or Japan—it’s inconceivable!”

And studies of non-physician clinicians in Mozambique and in other countries that use the model have reported good outcomes. Increased access to surgical care has likely played a part in reducing Mozambique’s maternal mortality ratio, which remains high but fell by 64% between 1990 and 2013, according to a WHO report.

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Victor Muitiquile, a surgical technician at the Chokwe Rural Hospital in Mozambique’s Gaza province, says he wants to see technicians all over the country. Only about 60% of Mozambique is covered by surgical technicians, because of resource constraints. “We cost less than specialists and we resolve some of the most serious problems the population is facing”, he said.

Yet it’s not without complications. On any given day, the hospital can lack anaesthetics, certain antibiotics, or even clamps and needle holders, Muitiquile said. Electricity is spotty and the linens and scrubs in the 125-bed hospital are washed by hand. The work also takes a considerable toll on technicians’ personal lives, says Muitiquile, who is virtually always on call.

Driven to innovate

The CURE Children’s Hospital of Uganda where Joshua was treated has shown that investing in surgery in a resource-poor country can have some unexpected positive side-effects. Benjamin Warf, a paediatric neurosurgeon who now works at Boston Children’s Hospital and teaches at Harvard Medical School, helped

open the hospital in 2000. Warf saw a shocking number of babies with hydrocephalus when CURE opened.

In the USA and Europe, the standard treatment for hydrocephalus is a shunt, a plastic tube that drains excess fluid from the brain. But shunts often fail or become infected. In the USA, these events are stressful for families and costly for the health-care system, but rarely fatal. But Warf worried that placing shunts in children whose families are poor and live far from medical facilities could be catastrophic. “You’re making a child dependent on something that can’t be sustained safely”, he said.

Looking for a permanent fix that didn’t rely on shunts, he developed a minimally-invasive technique called endoscopic third ventriculostomy with choroid plexus cauterisation (ETV/CPC). Ugandan surgeons began approaching him, hoping to learn the technique. A Ugandan neurosurgeon, John Mugamba, ended up replacing Warf when he returned to the USA in 2006. And the hospital has become a training centre for surgeons from all over the world; about three dozen have learned the technique in Mbale and taken it back to their home countries. The treatment is increasingly used in the USA, too. It was the challenges of working in Uganda, Warf says, that drove him to innovate. “You can find out how to do things better and more cheaply when you are in an environment that’s forcing you to do it”, he said.

In May, the World Health Assembly will vote on a resolution recognising surgery as a component of universal health coverage, a step proponents say would drive donors and attention to the issue. Without making surgery a priority, it will be impossible to achieve broader global health and development goals, Yamey said, adding: “This is a movement to try to redress one of the gross inequities in public health.”

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