Dr Shrikant Jaiswal is the first and only anaesthetist in Umarkhed, the central Indian town in the state of Maharashtra closest to the rural village where my father grew up. Jaiswal is 34 years old. He was born and raised there, the son of a local government clerk, and returned after completing his medical training 6 years ago.

Umarkhed’s public hospital serves a community of 60 000 urban dwellers and a quarter million others from over 100 surrounding villages. The hospital has 30 beds, a maternity ward, and basic surgical facilities. Until Jaiswal arrived, however, its operating room was not used very much. The two obstetrician-gynaecologists in town did some elective procedures under local anaesthesia, such as lipoma excision, abscess drainage, tubal ligation, even vasectomy. But they could not manage complex or emergency cases except when a travelling anaesthetist came, which was infrequently. Faced with a woman in obstructed labour or with life-threatening post-partum haemorrhage they could do little more than send her to a town with better capabilities and hope she made it.

Growing up, Jaiswal had drive and did well in school and was admitted to university in Mumbai. There he completed medical school and a 2-year diploma in anaesthesiology. And there he might have stayed, he told me when we spoke by phone recently. But, he said, “one day, I received a call from family members that my father was having chest pain: ‘what should we do?’ I could not remember even a single doctor who could do an ECG, read an ECG, and treat his problem.” Jaiswal was lucky. His father recovered. Shortly afterward, however, his brother-in-law had a myocardial infarction and, with no treatment available, he died. “I thought, ‘If this is my family’s problem, what must be the problems of other people in Umarkhed?’” So Jaiswal and his wife Priti, an obstetrician-gynaecologist, decided to return to the community.

The first question was how to make a living—the worldwide challenge of doctors who work in low-income countries. Government posts pay poorly—about a quarter of the private sector, Indian doctors told me. Moreover, surgical equipment and staffing are often inadequate, since government hospitals often treat surgery as a low priority. As a result, although only a portion of the population can afford health care in the private sector, that is usually where most growth in surgical services occurs.

In Umarkhed, Jaiswal and his wife maintained a mix of both public and private practice. An orthopaedic surgeon came to work in town, and between him and the gynaecologists, Jaiswal found that they asked him to do anaesthesia for two or, if he was lucky, three patients a day. His most common case: emergency caesarean delivery. Second most common: open reduction, internal fixation for blunt trauma victims. To establish an adequate practice and income, however, he felt he should be doing twice the volume of cases.

An interesting thing happened, though, over the next few years. The presence in Umarkhed of someone skilled in managing surgical patients led people to bring complex patients of all kinds to him. Jaiswal has now treated, for instance, more than 200 people with acute myocardial infarction. The next level hospital is 2 hours away—well beyond the golden hour for treatment—and many people died trying to get there. So Jaiswal obtained an electrocardiogram machine and defibrillator and learned to provide thrombolysis with streptokinase, which he could get for 3000 rupees (about US$50) a dose. He also acquired a stock of dopamine, amiodarone, epinephrine, and other cardiac medications. With these capabilities, he said he’d pushed survival to at least 97% for those patients who made it to him for treatment.

Another example: Jaiswal has treated more than 300 people who have had snakebites. Poisonous snakes are common and deadly in India; snakebites account for one in 20 injury-related deaths, and one in 35 deaths among young people aged 5–14 years in the country. Villagers are especially vulnerable at night, since they sleep on dirt floors. The venom of kraits and cobras is neurotoxic, causing a descending paralysis that advances from ptosis to respiratory failure to cardiac arrest; the venom of vipers is nephrotoxic. Treatment requires antivenom and, commonly, respiratory support, which Jaiswal provides by endotracheal intubation and family-administered ventilation by self-inflating ambu bag for as long as a week. Antivenom is expensive—each vial costs about 1400 rupees ($22) and treatment typically requires 10 to 20 vials—and often causes anaphylactic reactions. But Jaiswal persuaded the government hospital to keep it in good supply. And Jaiswal has been successful in getting patients through anaphylaxis with epinephrine. He’d had just three deaths, he said. Between operative care and critical care, Jaiswal has made a reasonable living—and a gratifying one.

I asked Jaiswal what would most improve the area’s surgical services. The first thing he said was better safety equipment and practices. Umarkhed’s government hospital, like so many hospitals in low-income settings, does not have essential monitoring systems—even just a pulse oximeter—to assure him that his patients are adequately oxygenated and stable and to allow him to regulate his anaesthetic administration. He’s had only his
fingers, a stethoscope, and a blood pressure cuff to rely on, and that was not enough. Basic antiseptic protocols and precautions were often absent, too—surgical gloves were reused; gowns and instruments were not properly decontaminated and sterilised; handwashing was with soap instead of scrub solution. Antibiotics were given plentifully but indiscriminately and after surgery rather than before incision, resulting only in resistant infections. Jaiswal had learned better in training and saw, all too painfully, the difference for patients. Antisepsis and anaesthesia were discovered in the 19th century, but it was still a struggle to deliver the basics in the 21st century.

The community’s other desperate need was for a general surgeon, he said. People came to the hospital with strangulating hernias, ruptured appendicitis, gangrenous wounds, obstructing kidney stones, and there was no surgeon to see them. I remember when my uncle, who lived in this area, had a terrible motorbike accident and sustained multiple injuries, including a fractured pelvis. He was in haemorrhagic shock and needed basic trauma care, but there was nothing to be done except send him 45 miles over rutted roads to the next level hospital and pray.

The World Bank recently released an economic evaluation of surgery in its third edition of Disease Control Priorities and found that establishing capacity for 44 essential surgical procedures is as life-saving and cost effective as providing oral rehydration therapy, antiretroviral treatments for HIV, and vaccines. Ordinary people are acutely aware of this value, too—as the Lancet Commission on Global Surgery reports, tens of millions of people seek out surgical care even though one in four experience financial catastrophe as a result. Surgery is an indivisible, indispensable part of health care, but it is treated as a luxury. Without public investment, only large cities in low-income and middle-income countries usually have enough prosperity to develop general surgical capacity.

The next level hospital for Umarkhed, for example, is in Nanded, a city of about 600 000 that draws people seeking care from a surrounding population of some 5 million. The rising economy has improved circumstances enough that my surgeon-friends there say that about 40% of the population can afford private treatment. That has been enough for Nanded to support a surgical community of now 40 general surgeons and 65 anaesthetists, as well as six urologists, four paediatric surgeons, and three neurosurgeons. The surgeons practise under limited circumstances in small, solo hospitals, usually on the first floor of their home, where they have an operating room and four or five recovery beds. For the other 60% of the population, however, only eight surgeons and six anaesthetists work in the government hospital due to low pay, inadequate conditions, and frustrations with the frequent political and bureaucratic interference in care. The result is that the hospital’s morning surgery clinic has hundreds of patients seeking attention every day, with typically just three residents and one attending surgeon to see them.

I’ve seen the throngs of patients in Nanded myself, and their plight is distressing. About 20 patients have a clear indication for an operation the surgeons can do and go on the waiting list unless they are an emergency. 15 or so have more complex needs—for cardiothoracic surgery or liver surgery, for instance—and are referred to yet higher centres several hours away. Many patients need further investigations, but the radiology department has just two physicians and a resident who must service more than 1000 people a day from all specialties seeking ultrasounds, radiographs, and CT scans.

In 2008, however, the Indian Government launched a National Health Insurance Programme for the poor known as RSBY, the initials for its Hindi name Rashtriya Swasthya Bima Yojana. Families below the poverty line in, thus far, 25 states can register for just 30 rupees (about $0.50) to receive a biometric smartcard insuring coverage through a private insurer for health costs up to 30 000 rupees (about $500) for conditions that require admission to hospital, including essential surgical procedures. 37 million people have enrolled. In Nanded, many private surgeons are accepting the RSBY card, even though the payments are lower than they generally charge, and some surgeons now specifically cater to poor patients. It’s probably no coincidence that three local surgeons recently banded together to build Nanded’s first group hospital. The programme seems to be contributing to an increasing financial viability of surgical service provision.

This could be a pattern of how health systems change. My American hometown of Athens, Ohio,
with a surrounding rural population of similar size to Umarkhed’s, did not get its first permanent obstetrician until the end of the 1960s, just after the USA’s own health insurance programme for the poor, Medicaid, was adopted. A family doctor with limited training administered anaesthesia using drop ether, which was supposed to be of only historical interest by then, and when he wasn’t available, the obstetrician had to do emergency caesarean deliveries with local anaesthetic alone. During the 1970s, two nurse anaesthetists came, as well as my father, the area's first urologist, and my mother, its third paediatrician. It wasn’t until the 1980s that Athens got its first anaesthesiologist—ironically, an Indian physician whom my father recruited.

According to World Bank statistics, the USA’s per capita gross domestic product (GDP) was more than $20 000 (in current dollars) when it provided insurance to the poor. India is at just $1500—it has started down this road well ahead of the USA. South Korea, by comparison, started somewhere in between but went much farther. It made social health insurance mandatory for industrial workers in large corporations in 1977, when it was at $4000 GDP per capita; and it achieved universal health insurance in the late 1980s, at less than $10 000 GDP per capita. For surgical services the result was a rapid transition from an utterly inadequate surgical capacity to a robust and advanced one, largely developed by the private sector. Indeed, South Korea’s more common problem today is overuse of surgery in addition to persistent issues in quality and safety.

We’ve now seen many countries transition from fragile, impoverished health infrastructures to more universal systems as their economies improve. But there has been little understanding of how societies can best accelerate their progress. The Lancet Commission on Global Surgery reports that 5 billion people lack access to safe, affordable surgical and anaesthesia care when they need it. There is a clear need for discovery of how societies can most effectively increase provision of essential surgery, as well as its quality and safety.

4 years ago, my institution and I joined with the World Federation of Societies of Anaesthesiologists and the Association of Anaesthetists of Great Britain and Ireland to help found Lifebox, a global charity devoted to saving lives through safer surgery. It started by doing work that reduced the cost of hospital-grade pulse oximeters for low-income countries by over 80%. Through donations, Lifebox has been able to distribute more than 9000 oximeters to hospitals in settings where even the lower cost was unaffordable and, through a volunteer network, supplied 3000 anaesthesia providers with safety skills training. This work has so far improved standards for more than 10 million patients in 90 countries. Next, Lifebox is developing and testing strategies to improve antiseptic standards in these settings. If this is what a small organisation can do with just six staff and minimal resources, consider what the world could do if it made improvement of essential surgical care a recognised priority.

Listening to Dr Jaiswal on the phone, I realised that for all the communities Lifebox had helped, we had not helped the community where my own family had come from. I gave Lifebox Jaiswal’s address and made a donation for three oximeters to be delivered, one for his use in the operating theatre, one for the labour ward, and one for its surgical recovery room. He was immensely grateful. It would make a difference. Still, conditions in Umarkhed clearly have a long way to go.

As we talked, Jaiswal told me about a patient he had seen the day before. It was “a very horrible experience”, he said. A family had brought a 12-year-old boy to the government hospital with blunt trauma from being run over by a bullock cart. The orthopaedic surgeon called for his help. Jaiswal found the boy to have blue lips, a weak, rapid pulse, and no breath sounds in the left chest. He had obvious rib fractures. The boy had a tension pneumothorax. But the hospital did not have even an 18-gauge needle. Jaiswal sent someone running to his own supply and after agonising minutes, he plunged the needle into the boy’s chest and got the little whoosh of air he was praying for.

A colleague found a chest tube in the supplies of a private clinic. Jaiswal had placed just one chest tube before, during training. But he dug into his memory, made his best guess about which ribs to go between, and cut. The tube went in and 400 mL of blood poured out. The boy’s colour improved. He was breathing and had a blood pressure. Jaiswal hydrated him with crystalloid. The boy remained in shock, however. His pulse was over 150 beats per minute. And the breath sounds were now diminished on the right. They had no second chest tube. The boy needed a general surgeon. He was too sick to make it to Nanded. There was a town about half the distance in the other direction where Jaiswal knew a general surgeon. He called him and got him to agree to admit the boy in his private hospital, although the family had no money. Jaiswal hung two units of blood and sent him on his way. He was relieved to learn the next day that the boy had survived.

“We have a desperate need here”, he said. Then Jaiswal told me he had to go. He had been called to an emergency caesarean delivery.

“Maybe we could finish the discussion later?” he asked.

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