




Rural surgery as global surgery before global surgery

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Rural surgeons should be at the helm of global surgery efforts, yet we rarely hear from these pioneers. While high-income country (HIC) surgeons leverage their institutional power to publish in high-impact journals and advance their careers, rural surgeons tirelessly tackle the daily struggles of delivering quality surgical care in low-resource settings. Because of the current power structures within global surgery, the toil of rural surgeons is left out and remains unrecognised. With conscientious efforts to make global surgery more inclusive, however, we can harness the collective knowledge of rural surgeons who frequently devise creative, actionable solutions that can more immediately address barriers to care in low-resource settings.¹

Long before the term *global surgery* was conceived, rural surgeons were striving to secure healthcare for the 5 billion individuals who lack access to safe, affordable, surgical and anaesthesia care.² Beyond their role as clinicians, rural surgeons also have a long track record of advocating for their patients, who are usually the most socioeconomically disadvantaged of their region. This focus on equity and advocacy is recognised as a core feature of global health and global surgery.³

One example of a rural surgeon who exemplifies these values is Dr Radhakrishna D Prabhu. Born in Ankola, India and trained in Mumbai and the UK, Dr Prabhu returned to Shimoga, India with a mission to serve the country's marginalised rural population. Despite the stark economic disparities between Shimoga and the UK, he remained undaunted. Recognising that his patients would simply never get the operations they needed unless he was well-versed in a variety of surgical subspecialties, Dr Prabhu practiced broadly. In his career, he has performed 36 of the 44 WHO Essential Surgeries (figure 1), in addition to many more not on the list.⁴ Dr Prabhu is not alone in his clinical expanse. In a survey he conducted in 1986, he demonstrated that 66% of rural

Summary box

- ▶ Rural surgeons in low-income and middle-income countries have been providing life-saving surgeries to underserved patients in low-resource settings for many years, long before the term global surgery became popular.
- ▶ Rural surgeons like Dr Radhakrishna D Prabhu, who perform essential surgeries across multiple specialties and use cost-saving innovations to make surgery affordable, have valuable knowledge that can help and guide global surgery efforts.
- ▶ Rural surgeons should be leading the field of global surgery, but they have long been neglected by the academic global surgery community.
- ▶ The academic global surgery community can elevate the voices of rural surgeons by actively seeking and providing resources for their engagement in academic opportunities and lending support to rural surgeons' research and policy agenda.

surgeons performed surgeries in more than three surgical subspecialties.⁵ To overcome material and infrastructural constraints, he relied on his ingenuity. Facing severe blood shortages, Dr Prabhu pioneered a technology that we now know as autologous transfusion, the practice of collecting and retransfusing one's own blood.⁶ Another example of such resourcefulness is Dr Ravi Tongaonkar, an Indian rural surgeon and friend of Dr Prabhu, who invented the idea of using sterilised mosquito nets as a cost-effective alternative to commercial hernia mesh.⁷ This innovation from rural surgery demonstrated non-inferiority to commercial meshes in the rates of hernia recurrence and complications in a randomised controlled trial published in the *New England Journal of Medicine*.⁸ As the predecessor and embodiment of global surgery, rural surgery has numerous lessons to impart. To learn from the wisdom of rural surgery, we propose the following steps for the academic global surgery community:

First, global surgery conferences and societies must actively recruit and provide platforms for representatives of low/

- Dental*
- **Extraction**
 - Drainage of dental abscess
 - Treatment for caries
- Obstetric, gynecological and family planning*
- **Normal delivery**
 - **Caesarean birth**
 - Vacuum extraction or forceps delivery
 - **Ectopic pregnancy**
 - **Manual vacuum aspiration and dilation and curettage**
 - **Tubal ligation**
 - **Vasectomy**
 - **Hysterectomy for uterine rupture or intractable post-partum hemorrhage**
 - **Visual inspection with acetic acid and cryotherapy for precancerous cervical lesions**
 - **Repair obstetric fistula**
- General surgical*
- **Drainage of superficial abscess**
 - **Male circumcision**
 - **Repair of perforations (perforated peptic ulcer, typhoid ileal perforation, etc)**
 - **Appendectomy**
 - **Bowel obstruction**
 - **Colostomy**
 - **Gallbladder disease (including emergency surgery for acute cholecystitis)**
 - **Hernia (including incarceration)**
 - **Hydrocelectomy**
 - **Relief of urinary obstruction; catheterisation or suprapubic cystostomy (tube into bladder through skin)**
- Injury*
- **Resuscitation with basic life support measures**
 - **Suturing laceration**
 - **Management of non-displaced fractures**
 - **Resuscitation with advanced life support measures, including surgical airway†**
 - **Tube thoracostomy (chest drain)**
 - **Trauma laparotomy**
 - **Fracture reduction**
 - **Irrigation and debridement of open fractures**
 - **Placement of external fixator; use of traction**
 - **Escharotomy or fasciotomy (cutting of constricting tissue to relieve pressure from swelling)**
 - **Trauma-related amputations**
 - **Skin grafting**
 - **Burr hole**
- Congenital*
- **Cleft lip and palate repair**
 - **Club foot repair**
 - **Shunt for hydrocephalus**
 - **Repair of anorectal malformations and Hirschsprung's disease**
- Visual impairment*
- **Cataract extraction and insertion of intraocular lens**
 - **Eyelid surgery for trachoma**
- Non-trauma orthopedic*
- **Drainage of septic arthritis**
 - **Debridement of osteomyelitis**

Figure 1 List of 44 WHO Essential Procedures that Dr Prabhu has performed in his career. Bold denotes the procedures that Dr Prabhu has performed during his surgical career.

middle-income country (LMIC) rural surgery. Similar to how the National Institute of Health vowed to end all-male panels, or ‘manels’,⁹ global health organisations need to avoid all-HIC panels and executive boards and include more representatives from LMICs in leadership. The well-documented under-representation of LMIC attendees at global health conferences represents a missed opportunity.¹⁰ LMIC speakers and panellists will highlight the issues they face as well as successful solutions, allowing HIC and LMIC surgeons to learn, exchange knowledge and forge new partnerships. Additionally, hosting conferences

in ‘visa-friendly’ countries or LMICs themselves can ease a major barrier to attendance.¹⁰ HIC organisations must increase the amount of scholarships and grants to support rural surgeons to engage in global surgery events, as the costs of registration fees, travel and lodging are prohibitively high.

Second, while advocacy in global surgery has been dominated by the important work of incorporating surgical care into the health systems frameworks of national and international governing bodies, we argue that a broader frame is necessary for global surgery advocacy. For example, rural surgeons practice a wide scope of surgeries spanning multiple surgical specialties, as detailed in figure 1. Without formal recognition of the broad scope of practice necessitated in these contexts, rural global surgeons like Dr Prabhu feel they perform these life-saving surgeries at great personal legal risk.¹¹ Professional governing bodies and academic surgical societies can establish pathways for this recognition, which may include certification in different procedures and specialties, and global surgery advocates should actively lobby for more explicit protection from governments of surgeons in low-resource communities with a broad scope of practice.

Finally, before a global surgery trainee learns about Dr Prabhu or Dr Tongaonkar, they will more likely learn the names of HIC academic surgeons championing the cause of global surgery. Because the visibility of LMIC global surgeons is abysmally low, the trainee may envision these HIC professors as their global surgery role models. By publicising the works of physicians like Dr Prabhu, the academic global surgery community can help change this narrative. It can promote the research, advocacy and viewpoints of global surgeons in LMICs and create different avenues through which the broader community can learn. We hope that, in turn, trainees will realise that rural surgeons like Dr Prabhu are the true masters in global surgery and are inspired to take up the mantle and bring quality surgical care to the patients who need it the most.

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REFERENCES

- 1 Raykar NP, Yorlets RR, Liu C, *et al*. The how project: understanding contextual challenges to global surgical care provision in low-resource settings. *BMJ Glob Health* 2016;1:e000075.
- 2 Meara JG, Leather AJM, Hagander L, *et al*. Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development. *The Lancet* 2015;386:569–624.
- 3 Farmer PE, Kim JY. Surgery and global health: a view from beyond the or. *World J Surg* 2008;32:533–6.
- 4 Mock CN, Donkor P, Gawande A. DCP3 essential surgery author group. essential surgery: key messages from disease control priorities, 3rd edition. *Lancet* 2015;385:2209–19.
- 5 What is rural surgery? association of rural surgeons India. Available: https://www.arsi-india.org/what_rural_surgery.htm [Accessed 7 Nov 2021].
- 6 Popovsky MA, Devine PA, Taswell HF. Intraoperative autologous transfusion. *Mayo Clin Proc* 1985;60:125–34.
- 7 Tongaonkar RR, Reddy BV, Mehta VK. Preliminary multicentric trial of cheap Indigenous Mosquito-Net cloth for tension-free hernia repair. *Indian J Surg* 2003;65:89–95.
- 8 Löfgren J, Nordin P, Ibingira C, *et al*. A randomized trial of low-cost mesh in groin hernia repair. *N Engl J Med* 2016;374:146–53.
- 9 Time to end the manel tradition. National Institutes of health. Available: <https://www.nih.gov/about-nih/who-we-are/nih-director/statements/time-end-manel-tradition> [Accessed 6 Nov 2021].
- 10 Velin L, Lartigue J-W, Johnson SA, *et al*. Conference equity in global health: a systematic review of factors impacting LMIC representation at global health conferences. *BMJ Glob Health* 2021;6:e003455.
- 11 On Behalf Of The Association Of Rural Surgeons Of India-Lancet Commission On Global Surgery Consensus Committee Arsi-LCoGS Consensus Committee . The Lancet Commission on Global Surgery - Association of Rural Surgeons of India Karad Consensus Statement on Surgical System Strengthening in Rural India. *Healthc* 2019;7:7–9.