

Roadblocks and solutions to planning surgical care for a billion Indians

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India, the largest lower-middle-income country (LMIC), contributes one-fifth of the global population that lacks timely access to safe and affordable essential and emergency surgery.¹ Therefore, it is critical to address surgical care in India. The Lancet Commission on Global Surgery provided two tools that could be used to improve surgical care at a systems level in India: (1) assessment of Surgical Care Indicators and (2) development of a National Surgical, Obstetric and Anesthesia Plan (NSOAP).¹ Surgical care indicators evaluate timely access, workforce adequacy, delivery of care, perioperative mortality rate (POMR) and financial impact. The NSOAP identifies contextually relevant priorities and targets based on country stakeholders and conducts a cost assessment for the scale up of the surgical system.

Unfortunately, in India, the problems of incomplete, inaccessible and uncertain data limit the ability to move forward with surgical systems research and NSOAP creation.² The Lancet Commission report and the related research for India has found that shortages of surgeons, obstetricians and anaesthetists in the health workforce, low surgical volumes and high catastrophic health expenditure risk, were among India's major problems, with limited data on timely geographical access and POMR.¹ The data presented by the Lancet Commission comes from the late 2000s and hence has limited utility for planning in 2022. The indicators initiative published updated estimates for several countries in 2015 and 2017, but contained no new data on India.^{3 4} While important, estimates from the Commission do not provide the subnational details necessary for NSOAP development and do not address health equity issues. Understanding the needs according to patient population demographics (age, sex, caste, religion, socioeconomic and education group, etc), health sectors (public, for-profit

SUMMARY BOX

- ⇒ Over 90% of 1.4 billion Indians lack timely access to safe and affordable surgical care. Surgical, obstetrics and anaesthesia planning for India is arguably one of the largest undertakings in global surgery.
- ⇒ There is a paucity of granular data at the subnational level to develop an evidence-based National Surgical, Obstetric and Anesthesia Plan for India.
- ⇒ Several important data sources currently exist that could be combined to estimate the surgical care indicators.
- ⇒ Current initiatives to evaluate and scale up surgical systems in India must account for the large population percentage of children and include paediatric surgery.

private, trust/non-profit private) and areas of service provision (rural, urban, tribal) is critical for the development of India's NSOAP.

The lack of comprehensive subnational assessment of surgical care indicators across multiple dimensions—rural and urban regions, public and private healthcare providers, and paediatric and adult populations, inhibits NSOAP development. India lags behind Brazil,⁵ Colombia,^{6 7} Uganda,⁸ Zambia,⁹ Madagascar,¹⁰ Pakistan¹¹ and Somaliland¹² for mapping of surgical care indicators and is well behind Ethiopia, Nigeria, Zambia, Tanzania and Rwanda for NSOAP development.¹³

Surgical scaleup is dependent on several systemic factors including an ecosystem that supports local economic development, well-established surgical education pathways, robust health systems, attention to health policy and political commitment.¹⁴ In the last few years, there have been notable engagement and implementation efforts towards surgical care planning through the sign-off of the Karad Consensus Statement at the National Surgical Forum (2016). The statement was drafted by the Association of Rural Surgeons of India to propose the



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challenges and priorities for surgical scale up in rural areas comprising over 65% of the Indian population.¹⁵ Subsequently, the launch of Implementing Lancet Commission on Global Surgery in India (i-LCoGS-India) promoted multipartner 'centres of excellence' dedicated to systems strengthening.¹⁶ These two efforts have identified important challenges, such as: (1) the poor and unsafe blood supply infrastructure in the country, (2) low rural surgical workforce availability marred by limited training and unsustainable partnerships and (3) lack of needs assessment, relevant targets and surgical innovations scaleup for rural India. The initiative proposed several commitments towards intersectoral solutions and established secretariats for pilot fieldwork, research and policy outreach with support from private philanthropies. In addition to these efforts, Indian and global surgery stakeholders should focus on increasing government commitment by strategically integrating surgical indicators and planning in existing national-level programmes such as National Health Mission and Pradhan Mantri Jan Arogya Yojana (PMJAY).

If India is to develop a comprehensive surgical plan, it must not overlook surgical care for children. Over 1.2 billion children, 92.3% of the LMIC paediatric population, lack access to timely, safe and affordable surgical care.¹⁷ Surgical care for children is strongly warranted given the high morbidity and mortality of many conditions,¹⁸ and the provision of children's surgical care can protect families and economies from financial hardships.¹⁴ India needs to urgently take up paediatric surgical care in its health research and policy agenda, as it contains one of the largest paediatric populations globally with persistently high neonatal, infant and under-5 mortality rates. Notably, improving paediatric surgical care in LMICs can also impact global efforts towards achieving the sustainable development goals.¹⁹ The limited paediatric surgical workforce and training capacity currently impede surgical access in India that had 1.29 paediatric surgeons per 1 000 000 people in the last decade; 14-fold and 23-fold less than the USA and the UK, respectively.²⁰

To inform policy change and encourage government engagement, a comprehensive subnational baseline assessment of India's surgical system is essential. Six surgical care indicators, also included in the World Development Indicators dataset are defined as: surgical preparedness (timely access to surgical care facilities; indicator I), adequate surgical workforce (indicator II), delivery (population-level surgical volumes rate; indicator III), POMR (indicator IV) and impact measured by catastrophic (indicator V) and impoverishing (indicator VI) health expenditures due to surgery).^{1,21} This could be achieved through multiple ways that vary in required investment. First, data must be gathered for the Surgical Care Indicators across existing sources.

Timely access to surgical care (indicator I) can be obtained by building a Geographic Information Systems library detailing the locations of surgical facilities,

which is an ongoing project led by our group.²² Data for surgical workforce (indicator II) can be gathered from professional societies membership lists and merged with estimates from National Sample Surveys (NSS) on employment and labour workforce, District-Level Household and Facility Surveys and government reports such as the National Health Profile and Rural Health Statistics. Data for estimating surgical volumes (indicator III) and POMR (indicator IV) can be requested from the Health Management Information System (HMIS) and PMJAY claims database. HMIS is maintained by the Ministry of Health and Family Welfare and provides monthly subnational records for health facilities, predominantly rural public facilities. While it has been reported that HMIS has missing data, studies have validated cesarean-section volumes and other maternal health variables from HMIS against other standard sources.^{23–25} The PMJAY claims database, currently not publicly accessible at a granular level, is maintained by the National Health Authority and includes data on several clinical outcomes for enrollees that form the socioeconomic 'bottom 40%'. Estimates from the PMJAY data cannot be directly extrapolated to the broader society without appropriate correction for bias with regard to service utilisation and provision. For catastrophic and impoverishing health expenditures (indicators V and VI), NSS on consumer expenditure and social consumption can provide subnational estimates with additional insights from PMJAY claims data. Previously, NSS household surveys have been extensively used for general (ie, not specifically surgical) catastrophic health expenditure.^{26 27}

Second, prospective audits supplemented by independent field studies or high-level policy groups could also be useful. Recently, the All India Institute of Medical Sciences in collaboration with the government think tank—NITI Aayog conducted a pan-India assessment of emergency and injury care at secondary and tertiary care centres and district hospitals.^{28 29} Similar efforts, though resource-intensive, could assist in surgical care indicators mapping. Another alternative could be the addition of surgical indicators in the next round of the Demographic and Health Survey,³⁰ known as the National Family Health Survey in India. Third, with more investment, in the longer run, India needs to develop an open-access, integrated high-resolution surgical care indicators database with monthly data updated at the hospital level. This would be useful for implementing and updating an evidence based NSOAP.

India currently does not have an NSOAP in place. While the National Surgical Forum (2016) and other initiatives generated some momentum, the development of an NSOAP remains elusive. In the absence of subnational surgical care indicators and consensus-derived locally contextual targets for the indicators, it will be difficult to develop an evidence-based NSOAP. Given India's large population and geography-contingent socioeconomic and cultural diversity, efforts could also be focused on state-level surgical planning. Surgical policy

and planning could follow the path of India's climate change and human health planning, where states share a common national template to device plans specific to their needs.³¹

Thus, the surgical care of 1.4 billion people, one-seventh of the global population, including 534 million children who reside in India, remains uncertain and undermined without definitive data and a plan. India needs urgent comprehensive baseline assessment of its Surgical Care Indicators at subnational levels and long-term investment in data monitoring. Leveraging the indicators for integrating surgical care in India's health policy and planning is the next step that can eventually culminate in the country's first NSOAP.

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