

## A snapshot of surgical outcomes and needs in Africa



It is estimated that two-thirds of the world's population do not have access to safe, affordable, and timely surgical care.<sup>1</sup> Around 16.9 million people die from conditions that require surgical care each year, most of them in low-income and middle-income countries (LMICs).<sup>2</sup> In 2014, Jim Kim, President of the World Bank, challenged the global community to address this injustice, and to develop targets to measure progress on effective coverage of surgical interventions.<sup>3</sup> In response, the global surgery community developed a set of core surgical indicators that measure timely access, provider density, operative volume, surgical safety, and financial effects.<sup>4,5</sup> Used together, the indicators can measure the strength of a country's surgical system.<sup>4</sup> But many LMICs do not have the means to directly measure or report the baseline data that inform these indicators.

In *The Lancet*, Bruce Biccand and fellow investigators<sup>6</sup> from the African Surgical Outcomes Study (ASOS) provide country-level data from Africa for three core global surgical indicators: perioperative mortality rate, operative volume, and surgical workforce density, as well as findings for postoperative complications. Their study is the largest single prospective investigation of African surgical activity and outcomes as far we know to date—no mean feat on a diverse continent that has little infrastructure or resources for coordinated health surveillance. 247 hospitals from 25 countries (14 low-income countries and 11 middle-income countries) contributed data from 11422 adult patients who underwent an operative procedure as part of a 1-week snapshot of surgical activity.

The study design was necessarily pragmatic, using convenience sampling, routinely collected clinical variables, and a short data-collection period to prevent research fatigue. Per-protocol data collection was achieved in 11 countries only, and, although the study could provide an estimate of continental mortality, it was unable to recruit a sufficient number of patients to report on country-level mortality, or between-country differences because of lower-than-expected surgical volumes. This is both a missed opportunity and a reminder that collecting standardised country-level data for surgical care in LMICs is extremely challenging.

Postoperative complications (the primary outcome of the study)<sup>6</sup> occurred in 1977 (18.2%, 95% CI 17.4–18.9])

of 10 885 patients, mainly infections. One in ten patients who developed a complication after surgery died. A key finding from the study was that African surgical patients were twice as likely to die after planned surgery than the global average in a comparative cohort, and twice as likely to die from their complications despite being younger with a lower surgical risk profile, and undergoing less complex surgery (in total, 239 [2.1%] of 11 193 patients died, 225 [94.1%] occurring >24 h after surgery). Perioperative mortality rate (defined as the all-cause death rate before hospital discharge in patients undergoing a procedure in an operating room) has been proposed<sup>7,8</sup> as a universal indicator of safe surgery and anaesthesia. Although its clinical use is enhanced by risk stratification based on patient and procedural risk factors, crude estimates can act as important quality signals at a national level.

High perioperative mortality after surgery in Africa is an important but not unexpected finding. Patients in LMICs often present late when disease processes are advanced: 57% of operations were for emergency indications in this study, compared with around 25% emergency operations in cohorts from high-income countries.<sup>9</sup> Crucial resource deficits also hamper the safe delivery of surgical care in Africa; eg, a quarter of hospitals do not have a reliable oxygen source, a third do not have reliable electricity, 70% do not have a pulse oximeter, and 47% do not have dedicated postoperative care.<sup>4,10</sup> In the study countries, the average provider-to-population density of specialist surgeons, anaesthetists, and obstetricians (another core surgical indicator) was around 30 times lower than the recommended global minimum.

Although the main aim of Biccand and colleagues' study<sup>6</sup> was to quantify surgical outcomes, the most alarming finding was how few people actually received surgery. Surgical volume (the number of operations per 100 000 population) is an indicator of met need for surgical care. The ASOS findings suggested that this is unacceptably low in Africa. Among the 25 countries who contributed data, only a median 212 operations (IQR 65–578) were done per 100 000 catchment population. These numbers are 20 times lower than the crucial surgical volume required to meet a country's essential surgical needs each year (defined as 5000 operations per 100 000 people),<sup>4</sup>



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although the study did exclude paediatric patients—an important cohort given the continent’s population structure. Although strategies to improve perioperative care processes and structural quality are urgently needed, and might be easier to implement in the short term, the absence of surgery in Africa represents a silent killer that probably claims more lives. Identified barriers to accessing surgery in LMICs include cost, distance to care, and fear of surgery.<sup>11</sup> To measure effective coverage of surgical care—which is predicated on surgical access, volume, and quality—countries will therefore need to track more than one surgical indicator.

Encouragingly, this study was initiated, undertaken, and reported on by a collaboration of African clinician-investigators, showing the power of local and regional networks in generating surgical-indicator data at scale. Such collaborations are well placed to develop African research talent, shape national and regional priorities, and ensure study findings have a firm country footprint. However, indicators are only as strong as the data that underpin them. Biccarrd and colleagues’ study is a valuable contribution, yet it also highlights that longitudinal, representative data collection is required to accurately enumerate surgical need at a country level, especially while surgical volumes remain so low. Robust, representative, and reproducible methods are essential to ensure that everyone is counted—not just those who are easiest to count—and for stability of estimates from year to year. Africa is heterogeneous and more granular data is needed.

WHO’s member states have committed to monitor and strengthen surgical care by 2030.<sup>12</sup> A few African countries are making bold strides to include surgical indicator collection within new national surgical plans.<sup>13,14</sup> For most African countries, though, the development of robust surveillance methods and reporting systems will take time, coordinated investment, and firm political will. In providing a snapshot of surgical activity and outcomes on the continent, studies such as ASOS are helping to light the path; local governments, supported by regional health and development agencies, should now follow their example.

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