

# Children much more likely to die after surgery in poor countries

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Children in low resourced countries are 100-200 times more likely to die after surgery than children in wealthy countries, according to a first-of-its-kind study published in *Anesthesiology*.

Two billion of the world's [children](#) lack access to safe surgery and anesthesia, and the need for pediatric surgery in low- and [middle-income countries](#) is growing, according to lead author Mark Newton, MD, a pediatric anesthesiologist at Monroe Carell Jr. Children's Hospital at Vanderbilt and Director of Anesthesia Global Health and Development in the Department of Anesthesiology.

The pediatric surgery demand in low- and middle-income countries is growing, according to Newton, with children making up more than 50% of the population and up to 85% of those children requiring surgery before their 16th birthday.

"Most low-and middle-income countries have a severe shortage of pediatric surgeons and anesthesiologists," said Newton, Chair of the Department of Anesthesiology at AIC Kijabe Hospital in Kenya, where he lives 10 months out of the year.

"We know from practical experience that pediatric surgical mortality in these settings is high, but we have never been able to prospectively capture this data until now," he said.

In the new study, "Perioperative Mortality in Kenya: A Prospective Cohort Study from 24 Hospitals," Newton and co-authors establish a baseline pediatric perioperative mortality rate for the first time in East Africa and discuss factors associated with mortality.

The data from Africa demonstrates:

- Mortality from [pediatric surgery](#) in Africa is 100-200 times greater than in a high-income country.
- When not using the Safe Surgery Checklist (SSC), mortality increases over 200%.
- Surgery on children in Africa during night and weekend hours

increases mortality.

- Mortality is higher in primary hospitals compared to both secondary and tertiary hospitals.

Newton said he hopes the study will demonstrate the feasibility of collecting perioperative mortality data at scale and illustrate how it can be used to improve pediatric surgical care systems within countries in Africa.

"This study establishes a pediatric perioperative mortality rate for low- and middle-income countries which is 100 to 200 times higher than in [high-income countries](#)," Newton said. "It also illustrates how such data can direct quality improvements. For example, we found a link between failure to use the Safe Surgery Checklist and mortality, which can be useful for advocacy, education and enforcement of the use of this patient safety tool."

To establish a baseline pediatric perioperative mortality rate and factors associated with mortality in Kenya, the authors designed a prospective cohort study and measured 24-hour, 48-hour, and 7-day perioperative mortality at 24 Kenyan hospitals.

There were 6,005 cases analyzed, finding cumulative mortality rates of 0.8% at 24 hours, 1.1% at 48 hours, and 1.7% at 7 days postoperatively.

In this sample, the 7-day [mortality](#) was more than 100 times higher than in high-resource settings and associated with American Society of Anesthesiologists Physical Status III or more, surgery at night or over the weekend, and not using the Safe Surgical Checklist. Mortality was also higher in primary hospitals compared to secondary or tertiary hospitals.

Newton and James O'Neill, MD, emeritus professor of Pediatric Surgery, have established a fellowship program at AIC Kijabe Hospital

that has trained 10 pediatric surgeons and 16 pediatric anesthesiologists, in partnership with the University of Nairobi, from eight different African countries. Many of those trained have gone on to practice as the first pediatric surgeon or pediatric anesthesiologist in their home country.

"These newly trained pediatric surgeons and anesthesiologists are then supported to establish specialty training programs in their own countries," O'Neil said. "They will work as leaders to increase access to [surgery](#) for their countries' children and improve surgical outcomes."

**More information:** Mark W. Newton et al, Pediatric Perioperative Mortality in Kenya, *Anesthesiology* (2019). [DOI: 10.1097/ALN.0000000000003070](#)

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