Optimal country-level C-section rate may be as high as 19 percent

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The most commonly performed operation in the world is cesarean section, and rates of cesarean childbirth delivery vary widely from country to country, from as few as 2 percent to more than 50 percent of live births. The World Health Organization recommends countries not exceed 10 to 15 percent (10 to 15 C-section deliveries per 100 live births) for optimal maternal and neonatal outcomes.

New research examining the relationship between C-section rates and maternal and neonatal mortality in 194 countries concludes that as the country-level C- section rate increases up to 19 percent, maternal and neonatal mortality rates decline. C-section delivery rates above 19 percent showed no further improvement in maternal and neonatal mortality rates.

The results will be published in the *Journal of the American Medical Association* on December 1, 2015.

Researchers from Ariadne Labs, a joint center of Brigham and Women's Hospital and the Harvard T.H. Chan School of Public Health, and Stanford University School of Medicine gathered and correlated national C-section, maternal and neonatal mortality rates in a single year (2012) for all 194 World Health Organization member countries. Mathematical modeling was used to impute C-section rates for countries where data was missing and to account for other contributing factors such as health expenditure. This is the first study to offer a comprehensive analysis of C-section rates for all WHO counties in a single year. That approach

avoids bias caused by using data from varying years, since C-section rates and mortality change over time.

"On a nationwide level, our findings suggests there are many countries where not enough C-sections are being performed, meaning there is inadequate access to safe and timely emergency obstetrical care, and conversely, there are many countries where more C-sections are likely being performed than yield health benefits," said Dr. Alex Haynes, primary investigator of the study, a surgeon and associate director of Ariadne Labs' Safe Surgery Program. "This suggests on a policy level that benchmarks for C-section rates on country-wide level should be reexamined and could be higher than previously thought."

Dr. Thomas Weiser, study co-author and assistant professor of surgery at Stanford University School of Medicine, said the research presents a compelling argument for improving surgical capacity in countries where access to care is limited. In doing so, countries will develop stronger, more resilient healthcare systems as a whole, he said. "All the things you need to do to build up surgical capacity, like personnel training, improving supply chains, providing clean water and sterile environments, all contribute to general strengthening of healthcare systems," Weiser said.

The study emerges from ongoing research at Ariadne Labs and Stanford University School of Medicine looking at access to surgical care as a key indicator of comprehensive healthcare systems.

"It's important to recognize that our findings do not pertain to individual patients or individual facilities," said study co-author Dr. George Molina, a surgical resident and research fellow at Ariadne Labs. "Rather, our study can provide countries and policy makers some guidance about resource allocation and particular goals if they are trying to improve health care systems."

More information: *Journal of the American Medical Association*, dx.doi.org/10.1001/jama.2015.15553