

Global Health Day

Global Pediatric Surgical Workforce Density Correlates with Pediatric Mortality

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PURPOSE: Approximately 1.7 billion children worldwide lack access to surgical care, especially in low- and middle income (LMIC) countries. Complex, congenital care requires pediatric surgeons, thus the pediatric surgical workforce density (PSWD) is an indicator of access to complete pediatric care. Adult surgical workforce density correlates with maternal mortality rates and PSWD has demonstrated correlation with improved survival of complex pediatric surgical conditions. However, it is unknown if PSWD correlates with population-level health outcomes for children. We compared PSWD with pediatric mortality rates and calculated the minimum PSWD associated with a significant reduction in mortality.

METHODS: Using publicly available licensing registries, the number of pediatric surgeons practicing in a convenience sample of 26 countries between 2015 - 2018 was identified. The corresponding pediatric population and neonatal-, infant- and under 5-mortality rates were obtained for each country. PSWD was calculated as the ratio of pediatric surgeons per 100,000 children. Mortality rates were plotted as a function of PSWD and Spearman's correlations assessed the strength of correlation.

RESULTS: A total of 4 LIC, 8 LMIC, 10 UMIC and 4 HIC countries were analyzed. The median PSWD by income group was 0.03 (LIC), 0.12 (LMIC), 1.34 (UMIC) and 2.13 (HIC). PSWD correlated with neonatal (0.70, $p < 0.003$), infant (0.74, $p < 0.001$) and under 5 (0.74, $p < 0.001$) mortality rates. Survival rates improved with increased PSWD to a 0.3 threshold, beyond which further PSWD increases correlated with limited survival improvements.

CONCLUSION: PSWD correlates with pediatric population mortality rates. The current PSWD in LMICs, where a greater proportion of the population is < 15 , is inadequate to meet UN Sustainable Development Goal 3.2 for child mortality. The critical threshold of 0.3 PSWD could serve as a benchmark for national surgical planning. Though a robust health system involves all pediatric specialties, pediatric surgeons play a critical role in comprehensive care to improve childhood survival.

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